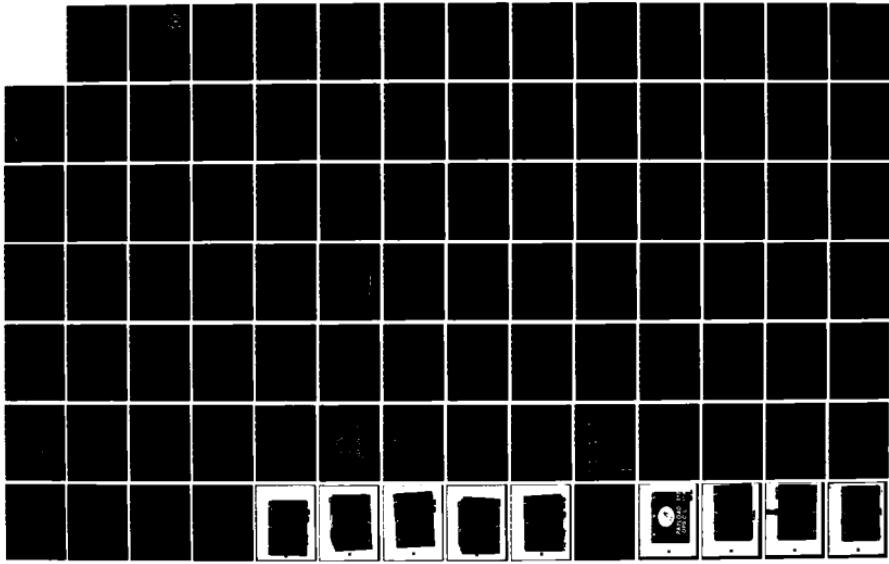
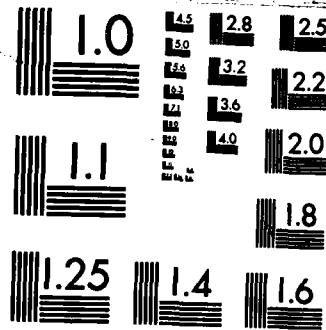


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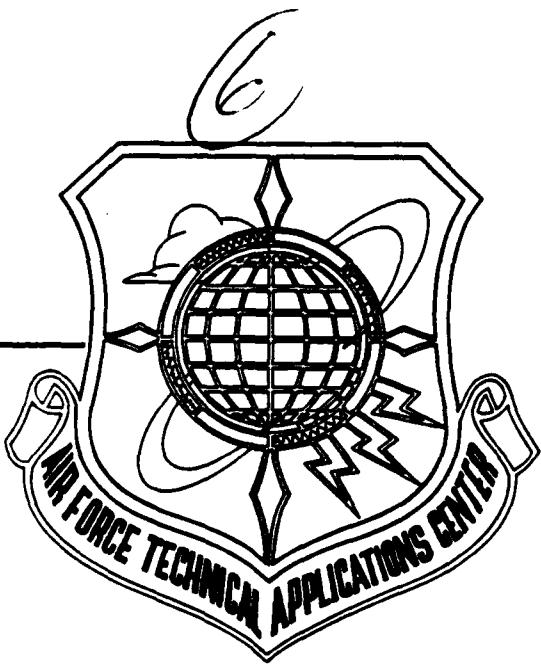


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EQUIPMENT EXPERIMENTS ON STS-41C,
41D, 41G, AND 51A



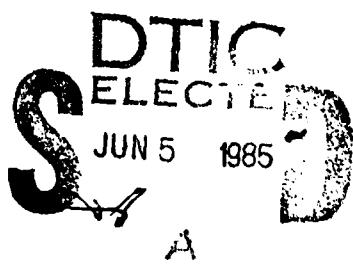
STEVEN E. CASH, RICHARD G. MADONNA,
MICHAEL R. McCLELLAN, AND MARK E. FIELDS

18 APRIL 1985

FINAL REPORT.

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SUMMARY

The Radiation Monitoring Equipment (RME) was flown on Space Shuttle Missions STS-41C, 41D, 41G, and 51A to provide in-cabin, real-time crew dosimetry, and to obtain time resolved gamma-ray background data and neutron/proton background data. The RME consists of two instruments, EG&G HRM-III gamma-ray counter and EG&G Pocket REM Meter (PRM) neutron/proton dosimeter. The HRM-III was operated by the astronaut crews 18 times during the four missions, with each operation lasting 52.5 minutes. The PRM was operated nine times with each operation lasting a minimum of approximately eight hours.

The results from the HRM-III operations are plotted as a function of time and as a function of ground position. The data show large increases in count rate during the periods when the Orbiter was in the South Atlantic and Southeast Asian Anomalies. Also, increases in count rate were observed as the orbit brought the Shuttle nearer the north or south poles. These data are consistent with data obtained from other missions.

The PRM results are displayed in tabular form. The average dose rate from these operations is .484 millirem per hour (mrem/hr) (.044 millirad per hour (mrad/hr)). The total mission neutron/proton dosages predicted by these readings are: STS-41C, 151.571 mrem (12.407 mrad); STS-41D, 33.914 mrem (3.333 mrad); STS-41G, 111.324 mrem (10.461 mrad); STS-51A, 44.9654 mrem (4.6979 mrad).

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SECTION I

INTRODUCTION

This report presents the results of the Radiation Monitoring Equipment (RME) experiments flown on STS-41C, 41D, 41G, and 51A. The objectives of the RME experiments are to provide in-cabin, real-time crew dosimetry and to obtain time resolved gamma-ray background data and neutron/proton background data.

The first objective was partially met during the flight of STS-6 (ref 1). The RME was flown for the first time on STS-6, and a limited amount of data was taken. The quality of the data was sufficient to convince us that the instruments will work in space, and, more importantly, that the crew can operate them and obtain meaningful data. Longer operations were required to fully meet the first objective since the instruments were not utilized to their fullest extent during the STS-6 mission.

The second objective was also achieved, in part, during the STS-6 mission. The neutron/proton dosimeter, EG&G's Pocket REM Meter (PRM), was operated for sufficiently long periods of time and gathered meaningful background data. The gamma-ray counter, EG&G's HRM III, was only operated for 10 seconds each time it was activated and did not yield enough background data to meet the second objective.

The STS-8 and STS-11 flights (ref 2 and 3) provided opportunities to meet both objectives of the RME experiments. During these flights, the HRM-III was operated a total of 11 times with each operation lasting 52.5 minutes. The PRM was operated four times with each operation lasting a minimum of 10 hours.

During the STS-6, 8, and 11 flights, the RME data convinced us that the crew can operate the RME to obtain valuable data. During STS-41C, 41D, 41G, and 51A, the RME provided real-time crew dosimetry capability and obtained time resolved gamma-ray background data and neutron/proton background data. During these flights, the HRM III was operated for a total of 15.75 hours and the PRM was operated for a total of 116.5 hours.

SECTION II

EQUIPMENT

HRM-III.

The HRM-III (Figure 1) (ref 4) is a hand-held gamma-ray counter. It weighs approximately 1 kilogram (2.2 pounds) and is about the size of a small cassette recorder. The circuitry is all solid state and microprocessor controlled. The detector is a mecuric iodide (HgI_2) crystal with a detection threshold of 100 kiloelectronvolts (keV).

The HRM-III has 105 internal memories that can store counting data for playback at a later time. These memories are filled with the average counts obtained during a user determined time interval. The interval can vary from 1/3 of a second to 33 seconds. Playback of the stored data is accomplished through a liquid crystal display (LCD) on the HRM-III. This record-playback feature allows for a time-history of the gamma-ray counts without having a user continually monitoring the instrument. (For a more complete description of the HRM-III, see reference 4).

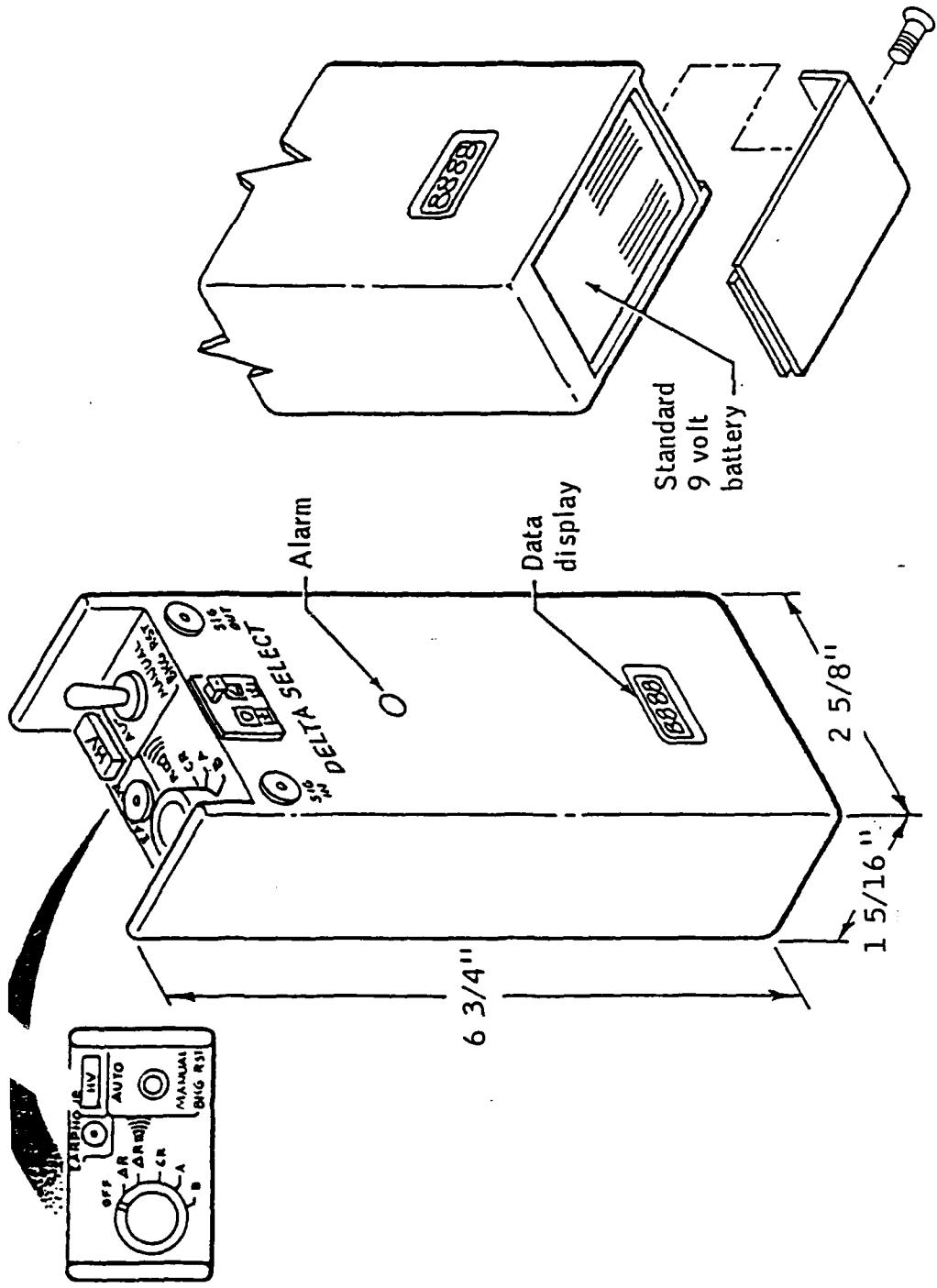
PRM.

The PRM (Figure 2) (ref 5) is a hand-held neutron/proton dosimeter. It weighs approximately 1 kilogram (2.2 pounds) and is slightly larger than the HRM-III. The PRM has microprocessor controlled solid state circuitry. It uses three ionization tubes as detectors. These tubes are surrounded by a tissue equivalent plastic. The associated electronics then produce data in the form of counts, rads and rems in real time.

Data are obtained via a LCD. The PRM will read out either hours (elapsed time since turn-on), counts, rads, or rems by changing the position of a rotary switch. The LCD displays the current value of the function (hours, counts, rads, rems) chosen and the LCD readout is updated as the value changes. Thus the PRM is a real time dosimeter. (For a more complete description, see reference 5).

Crew Training.

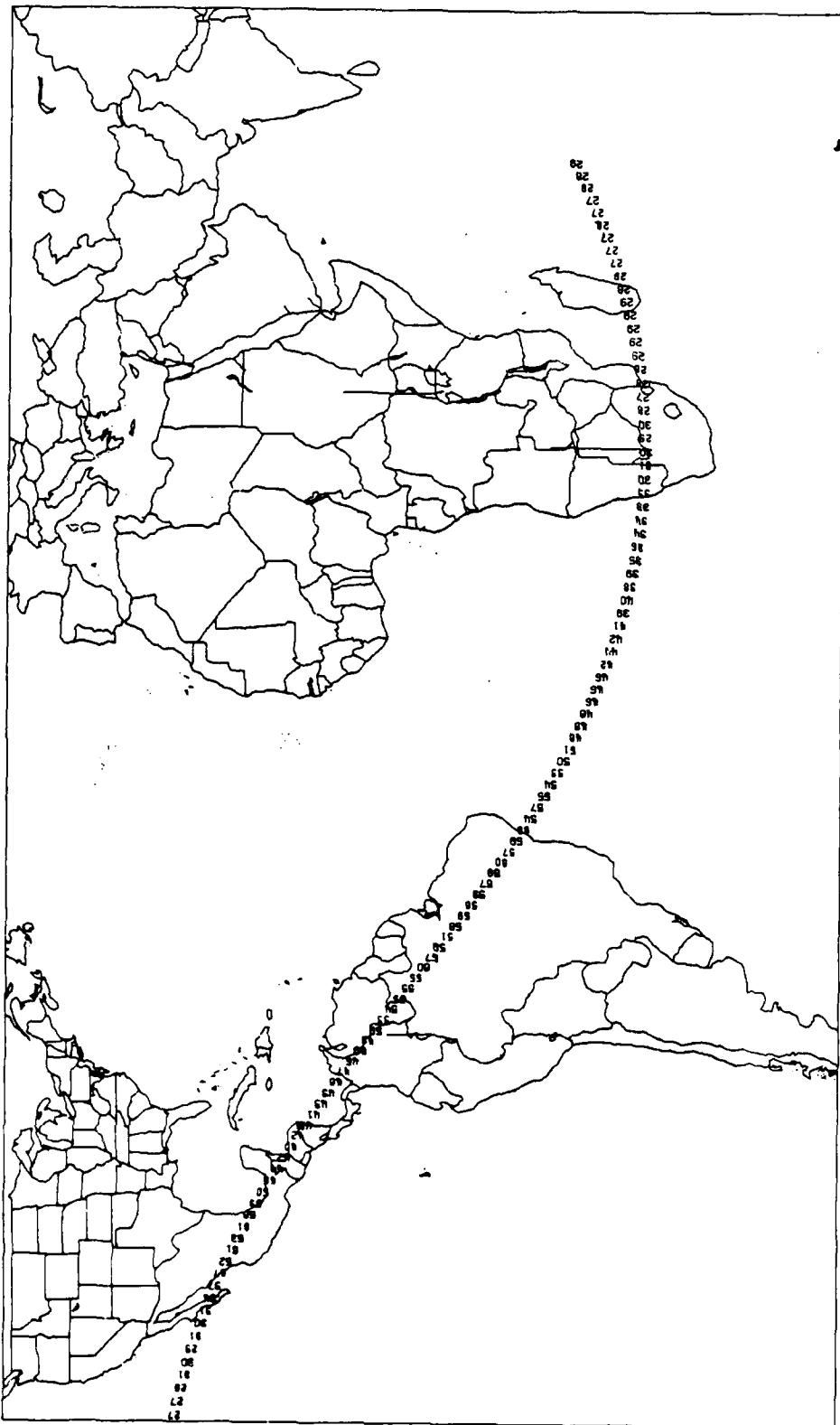
Crew training on the RME was accomplished at Johnson Space Center. The crews received a briefing on the instruments and were allowed to operate them. During this training briefing, questions that the crews had on the operation of the instruments were answered. The crews then practiced with two training units at Johnson Space Center.



Handheld Radiation Monitor (HRM-III)

Figure 1.

OPERATION NO. 2



S1541-0

Figure 14

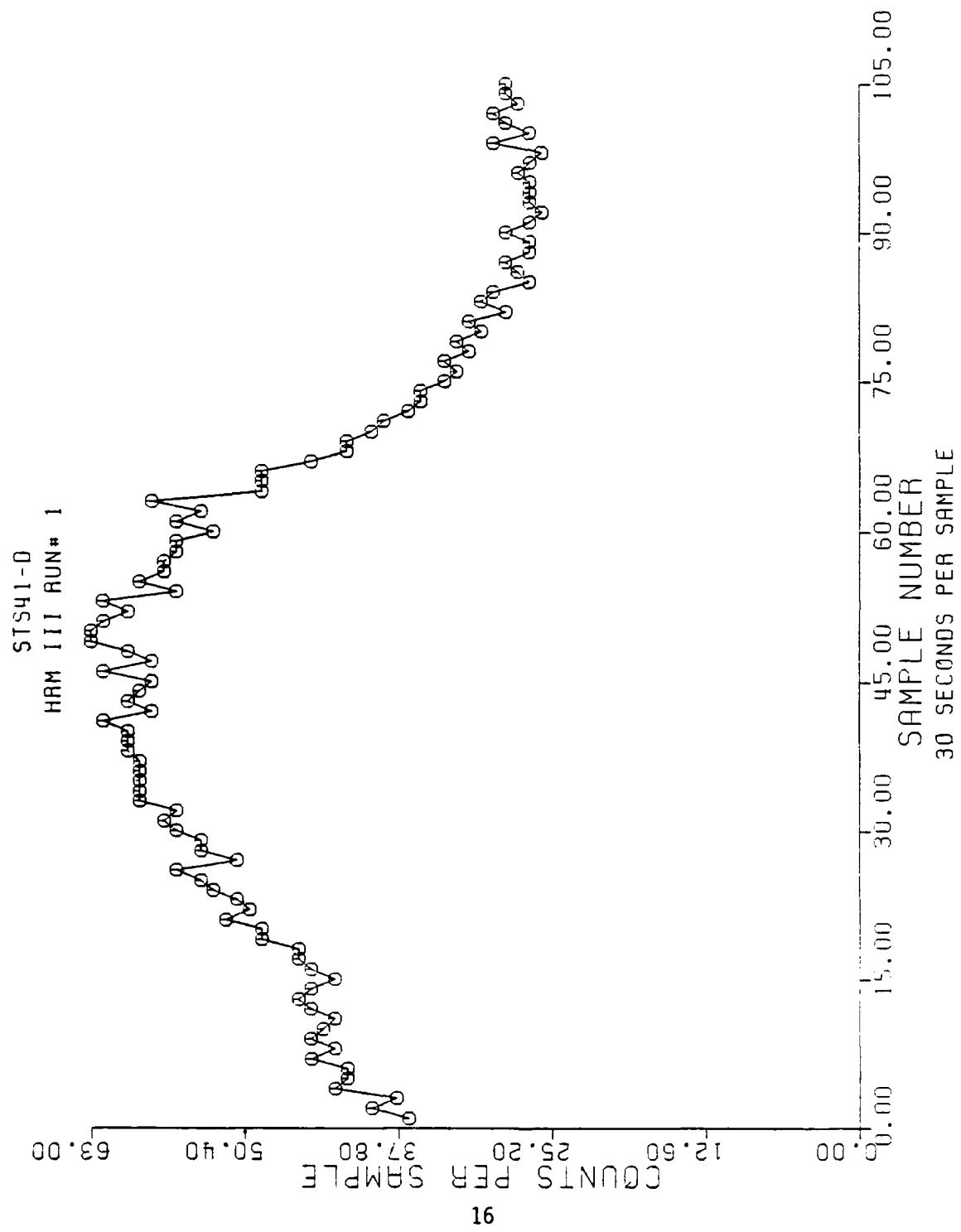
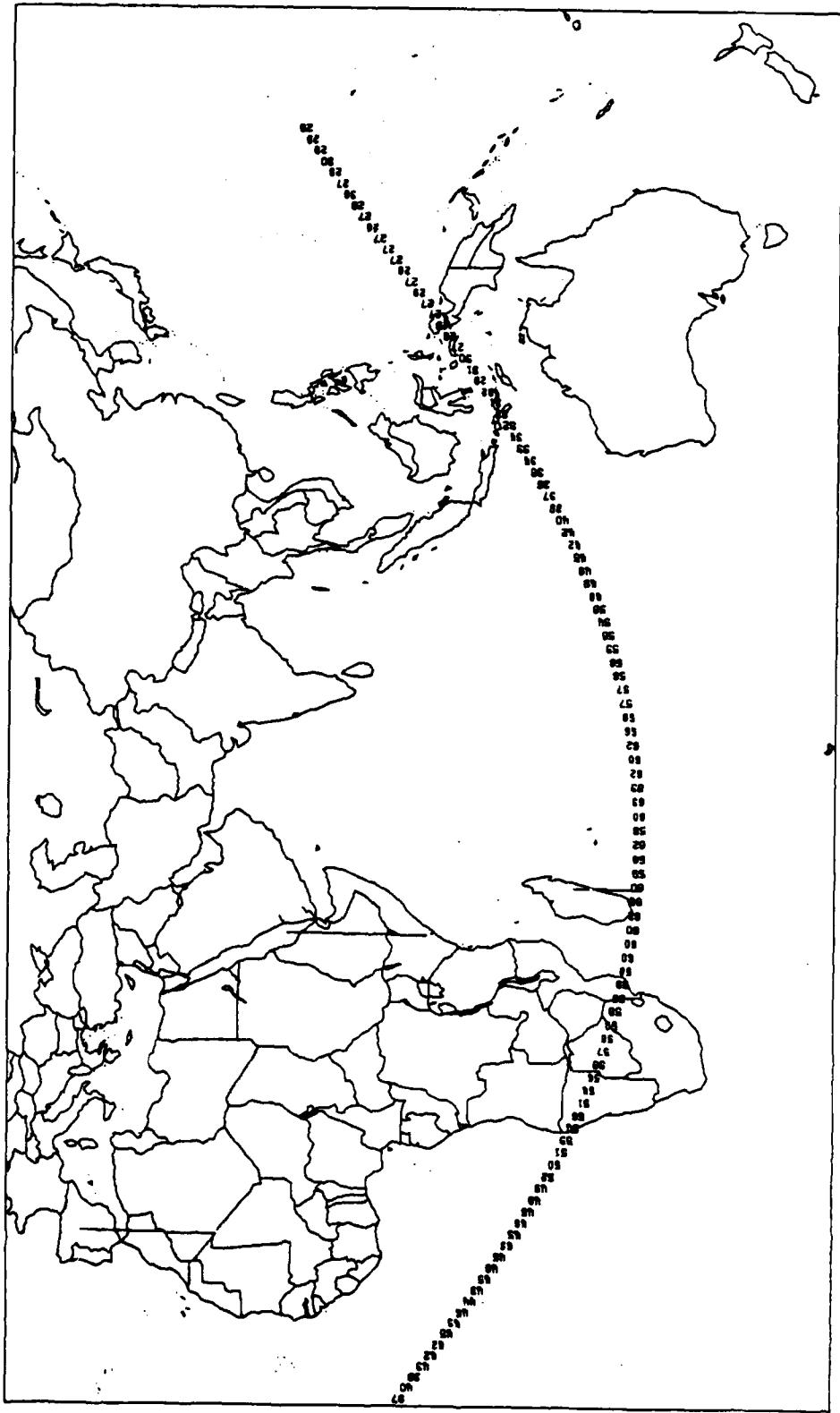


Figure 13

HRM-III

OPERATION NO. 1



STS41-D

Figure 12

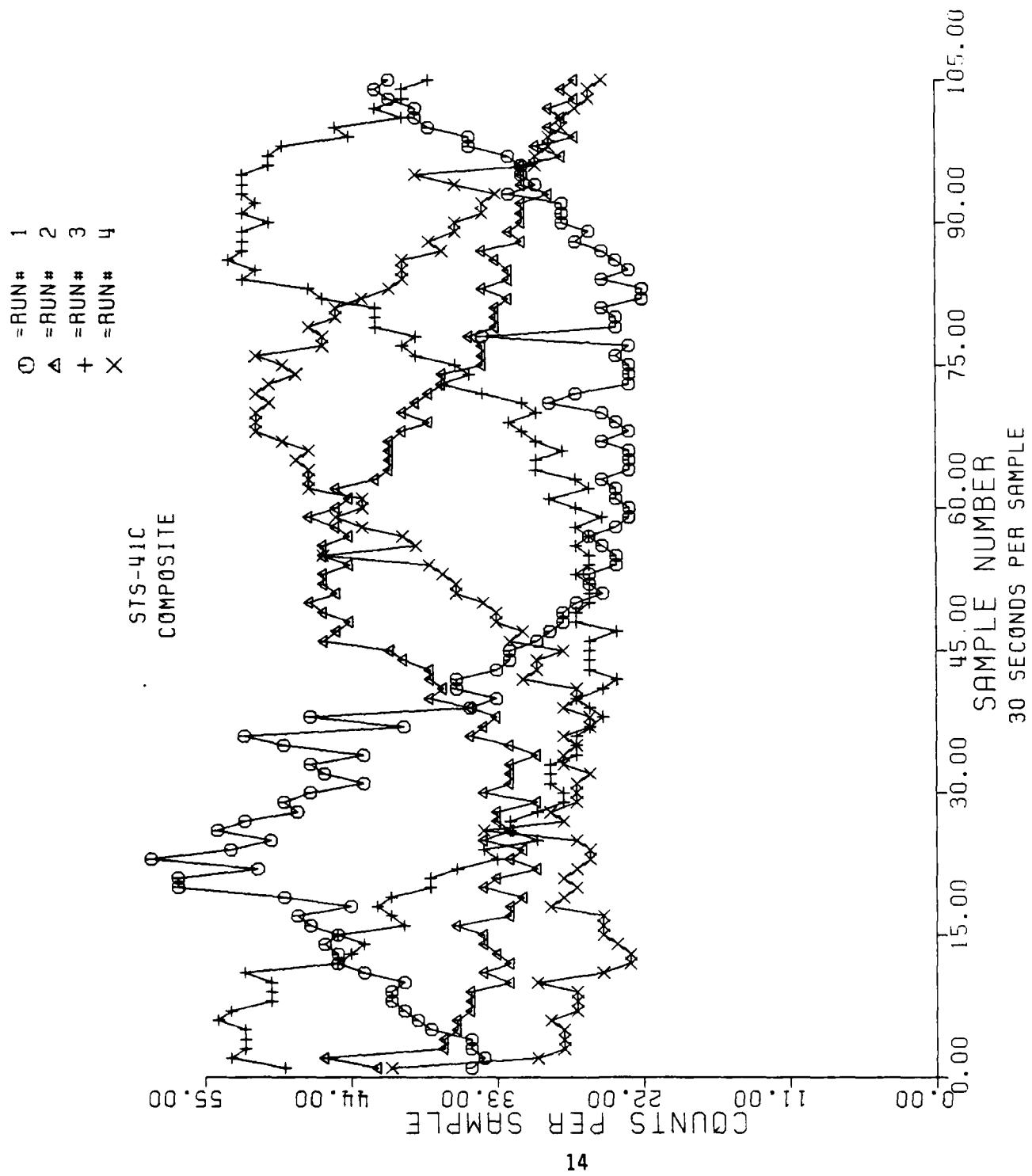


Figure 11

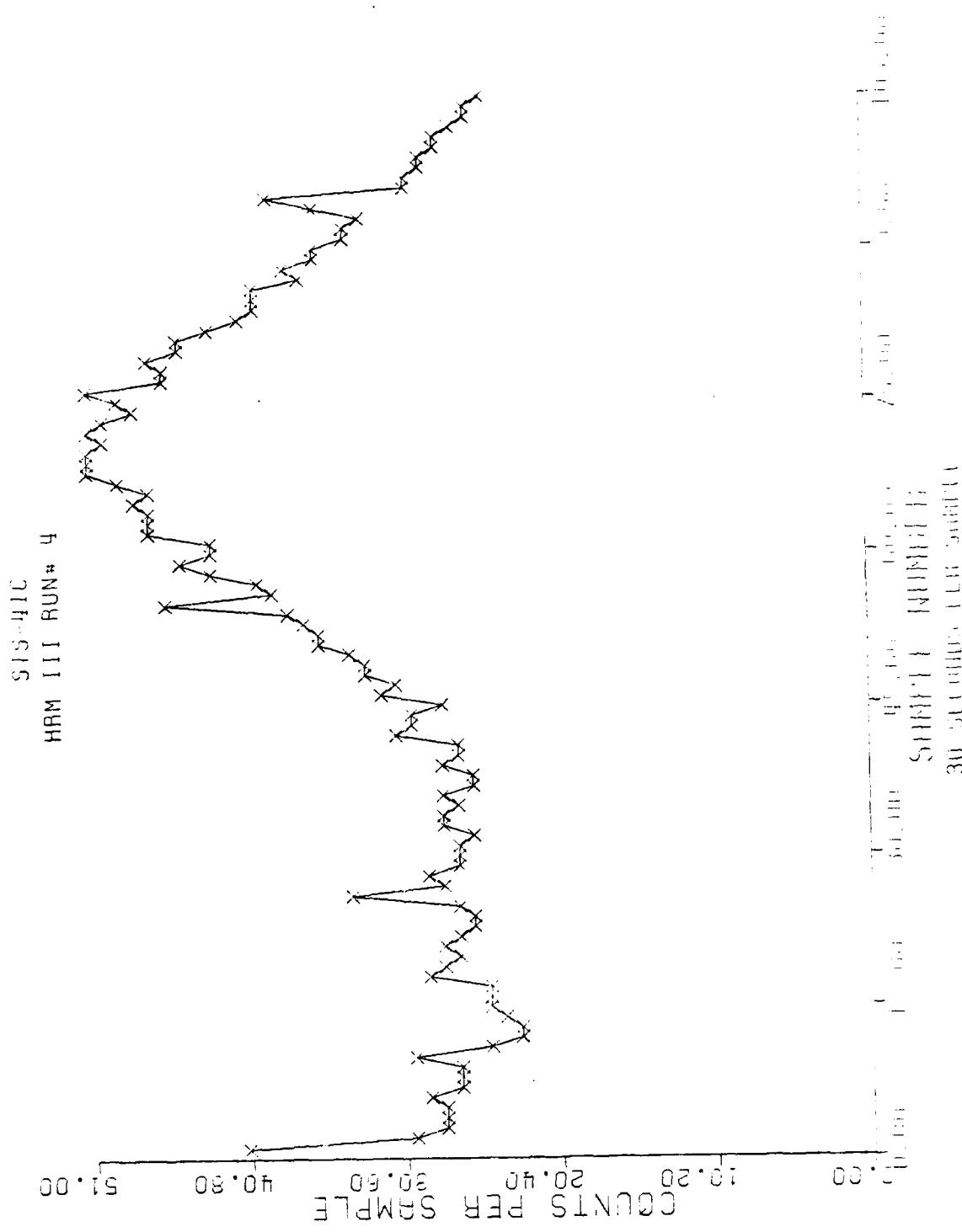


Figure 10

MISSION 41C STS13
HRM III RUN #4

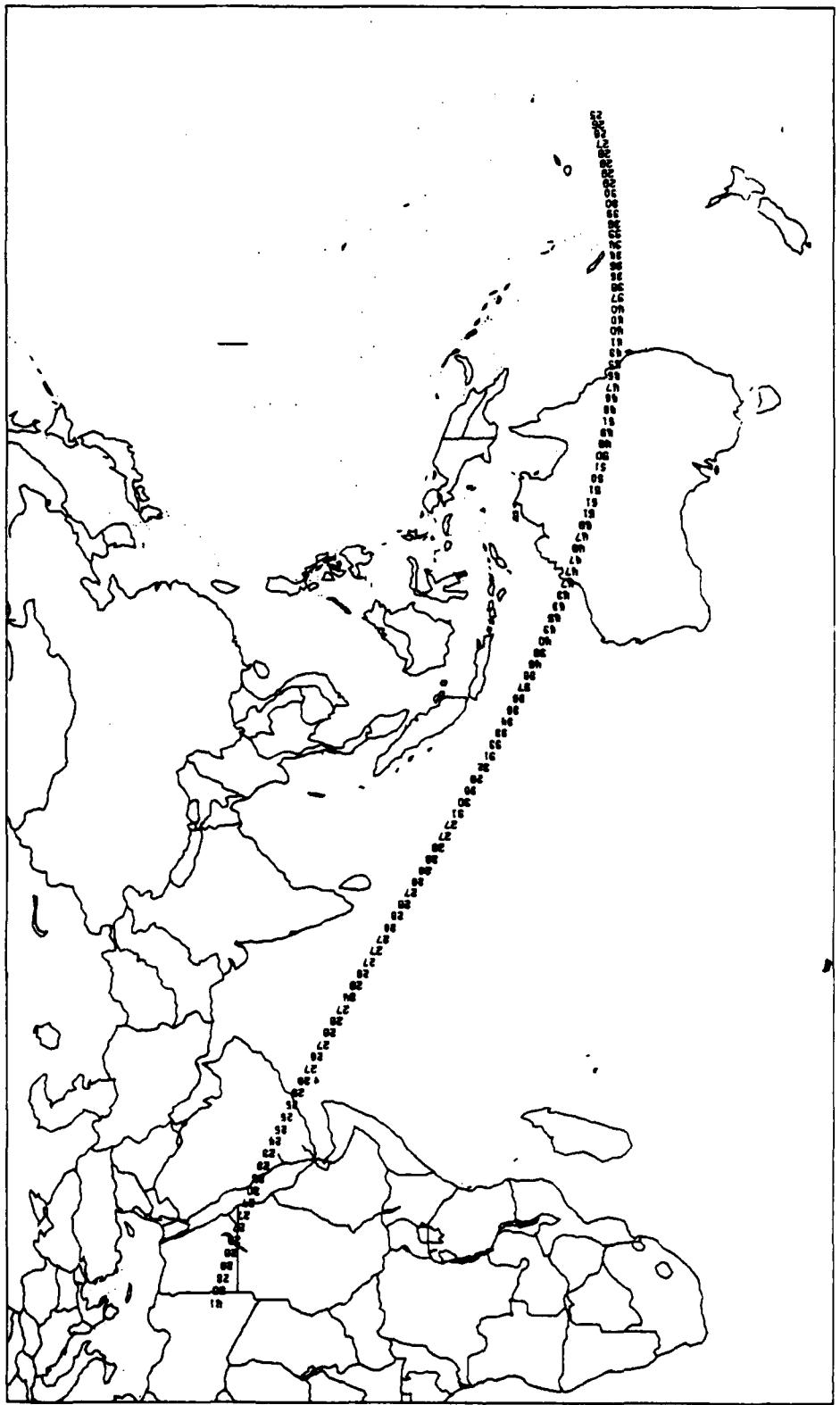


Figure 9

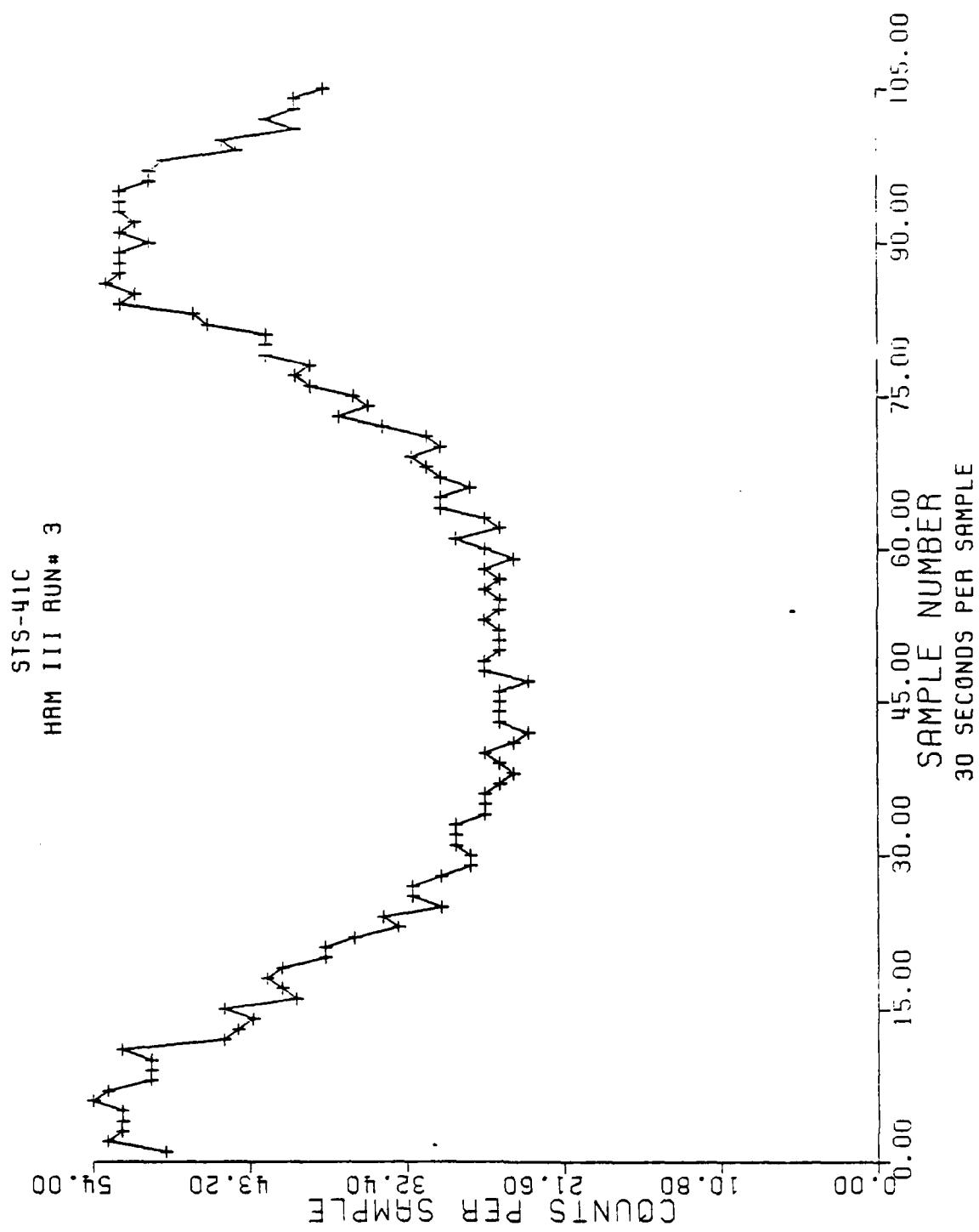


Figure 8

MISSION 41C STS13
HRM LII RUN #3

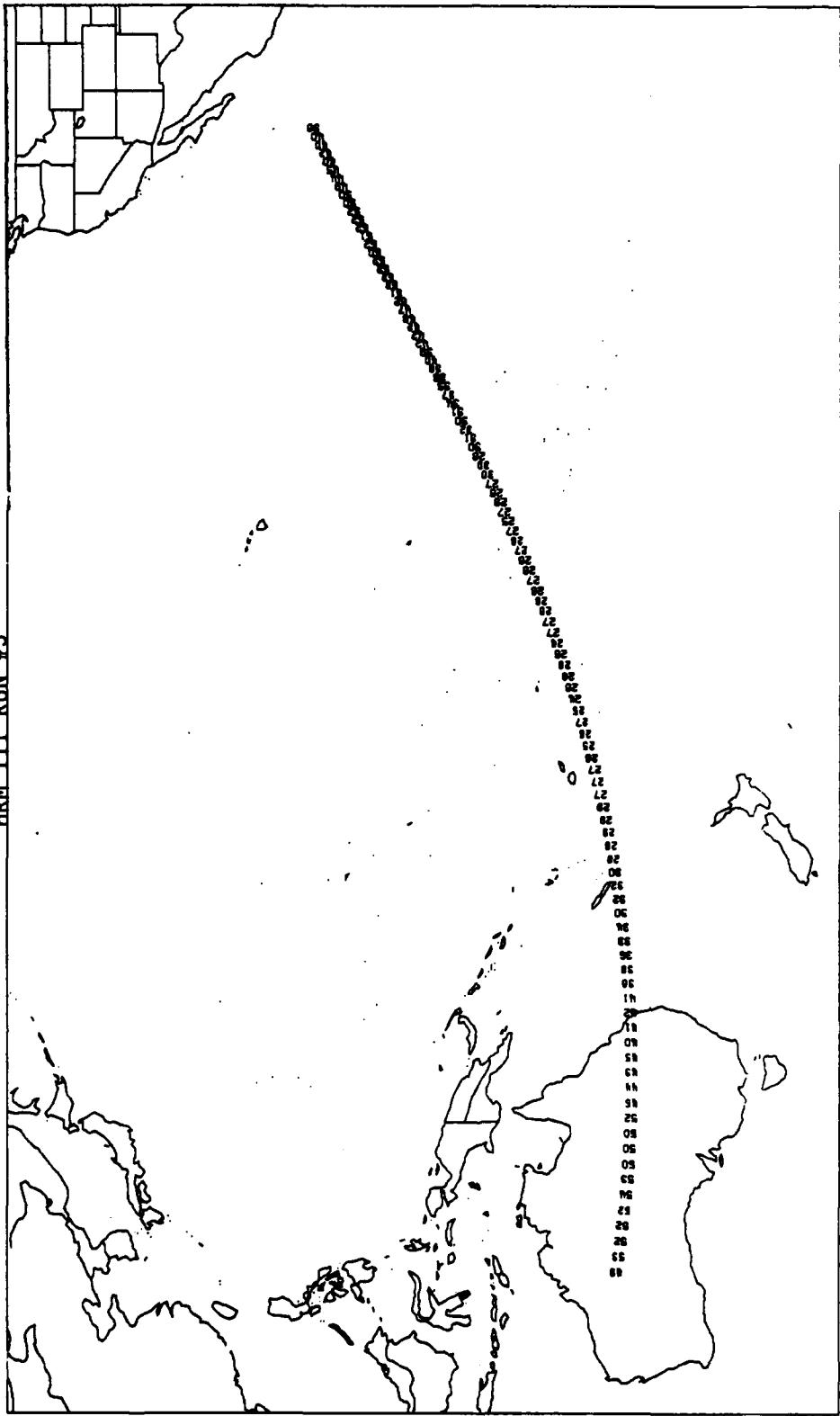


Figure 7

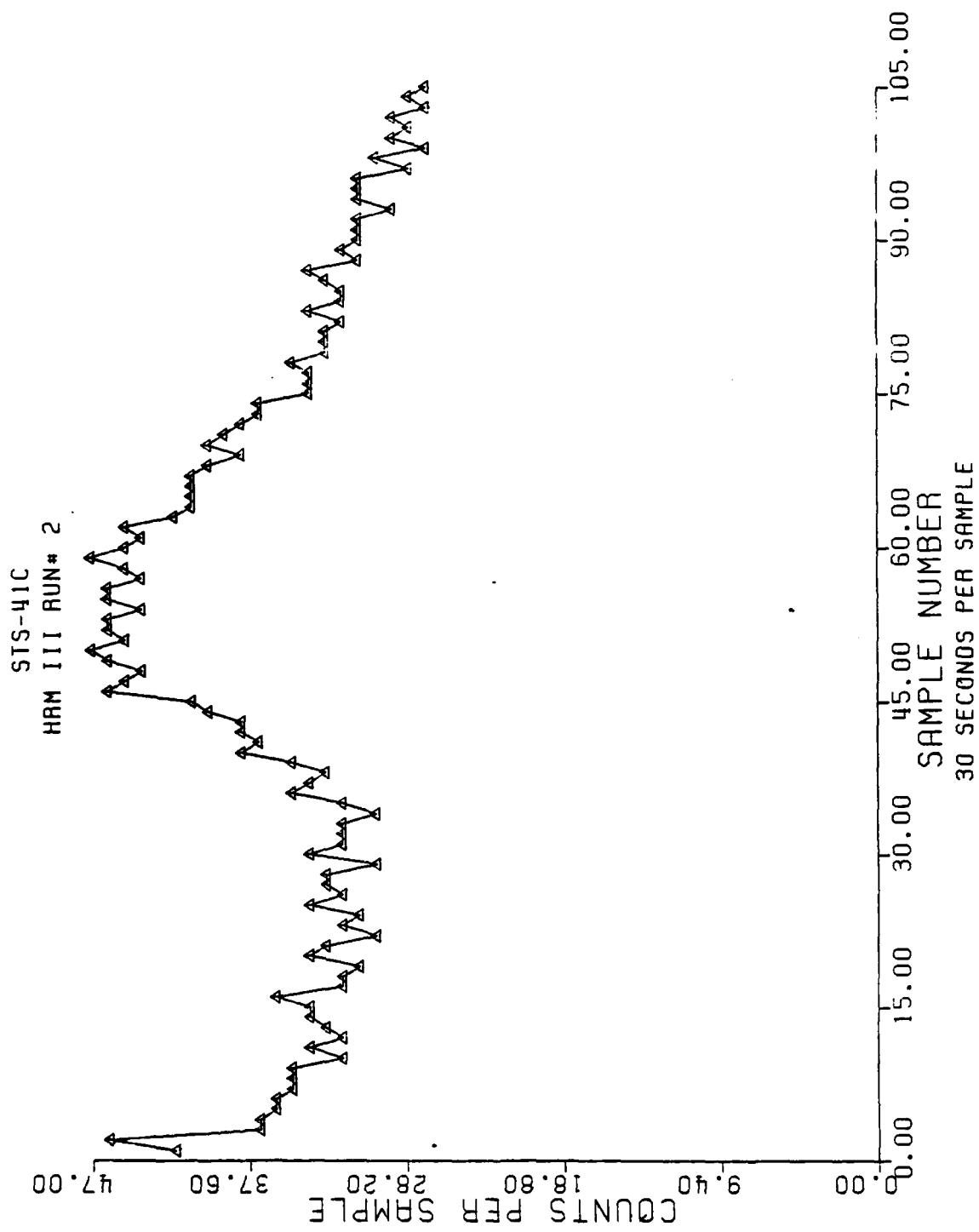


Figure 6

MISSION 41C STS13
HRM III RUN# 2

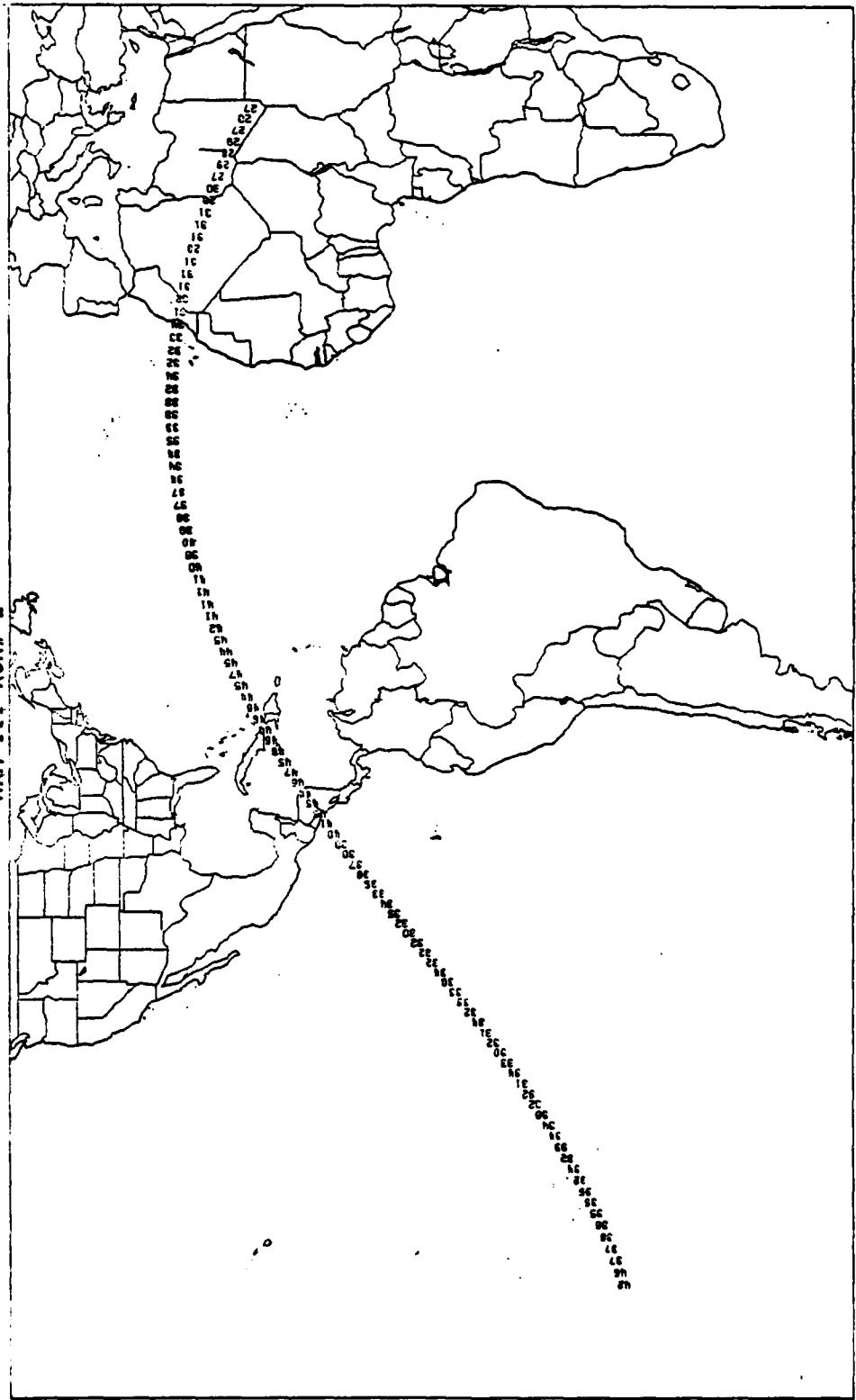


Figure 5

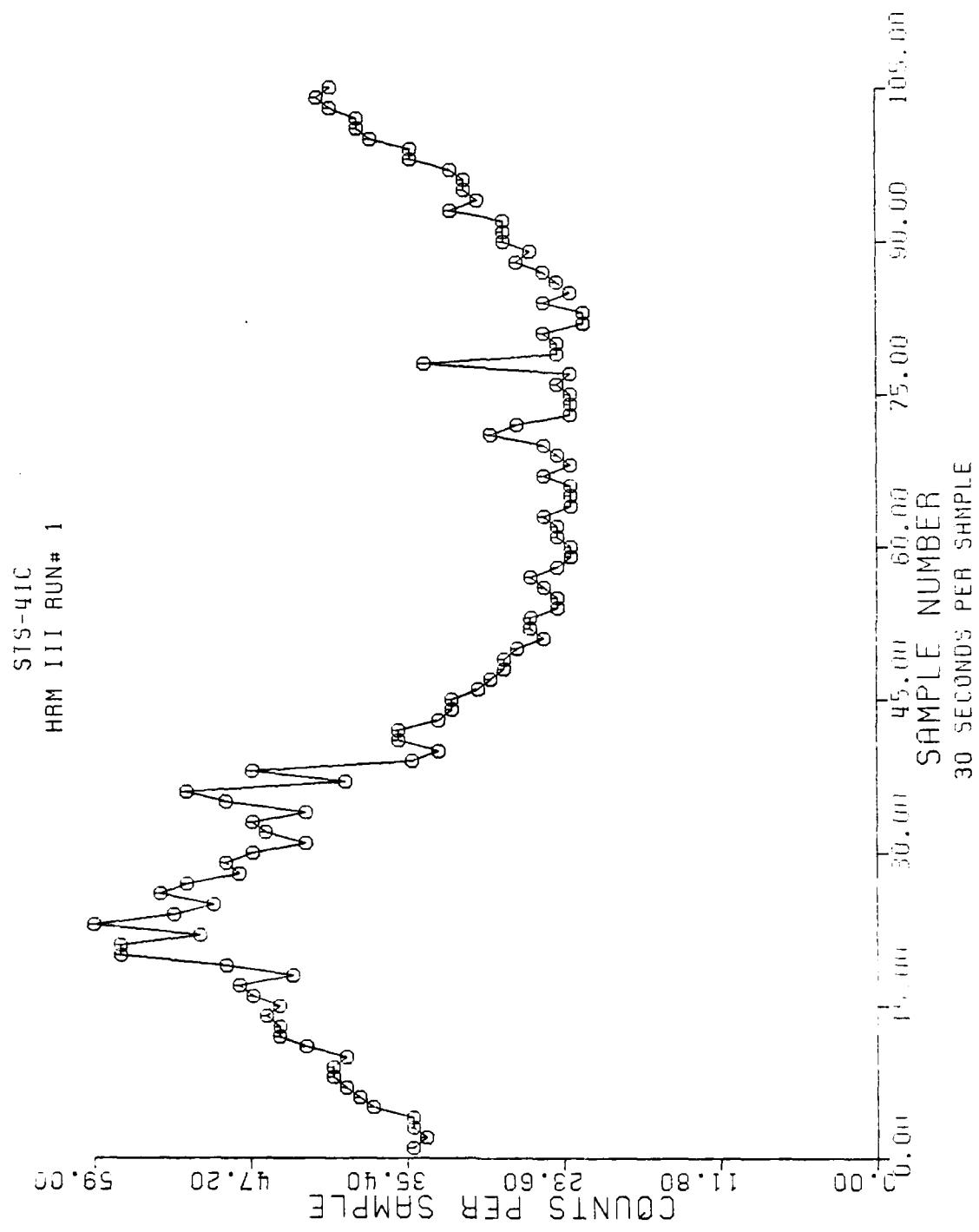


Figure 4

MISSION 41C STS13
HRM III RUN# 1

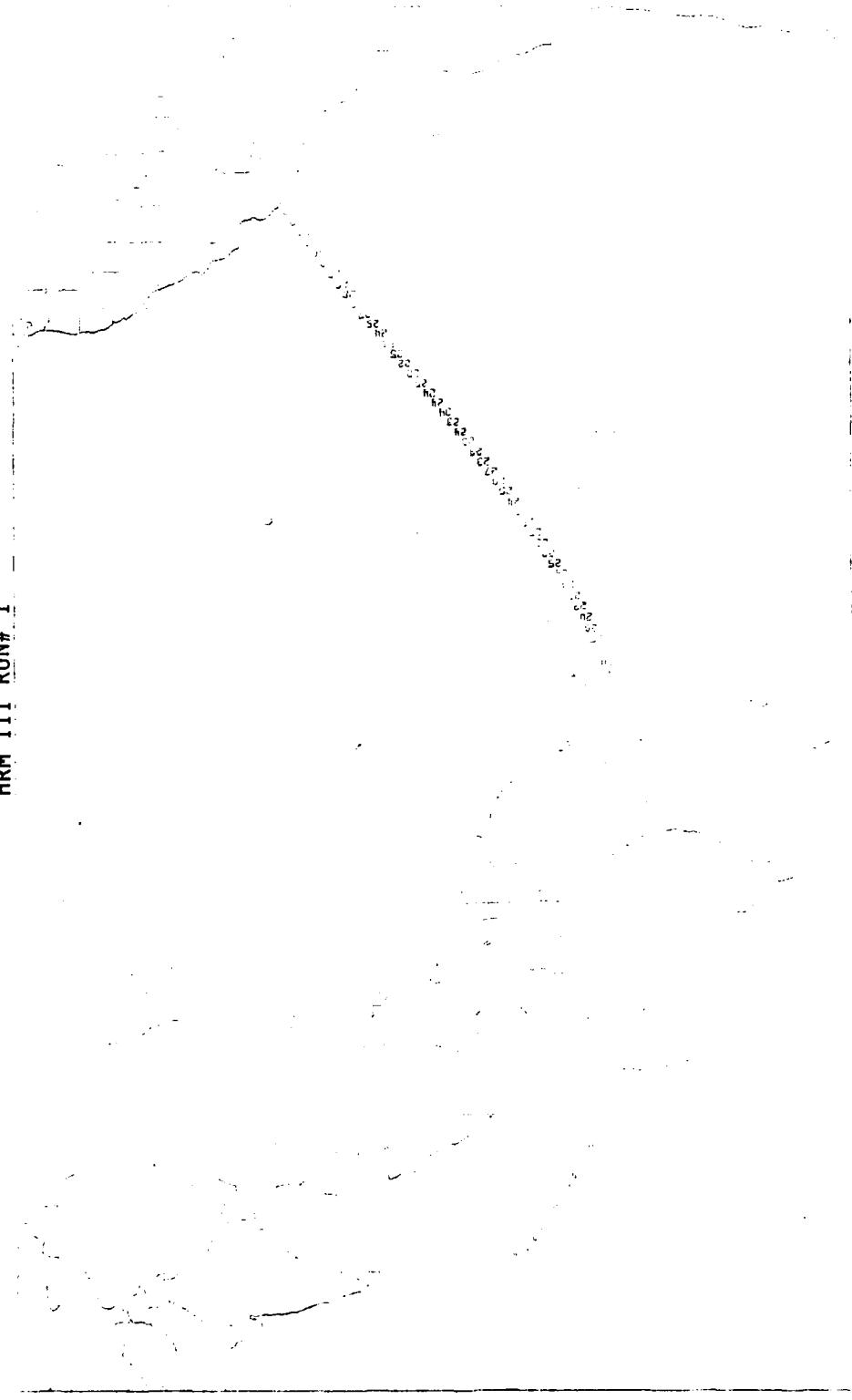


Figure 3

SECTION III

RESULTS

HRM-III.

During the STS-41C, 41D, 41G, and 51A flights, each HRM-III operation lasted 52.5 minutes with the device configured to fill one memory location every 30 seconds. For each flight, the data are presented in two ways. First, average counts per second are plotted on a map of the world, based on the Orbiter's subpoint. Second, average counts per second are plotted against elapsed time since device activation.

STS-41C.

The HRM-III was operated four times during STS-41C. The device performed well with no anomalies experienced.

Figures 3, 5, 7, and 9 show average counts per second plotted on a world map. Figures 4, 6, 8, 10, and 11 show average counts per second plotted against elapsed time.

The four operations produced very similar data. Low count rates are all experienced around the equator and fall between 22 and 27 counts per second. High count rates occur at the higher latitudes and fall between 47 and 59 counts per second.

STS-41D.

The HRM-III was operated six times during STS-41D with no anomalies experienced.

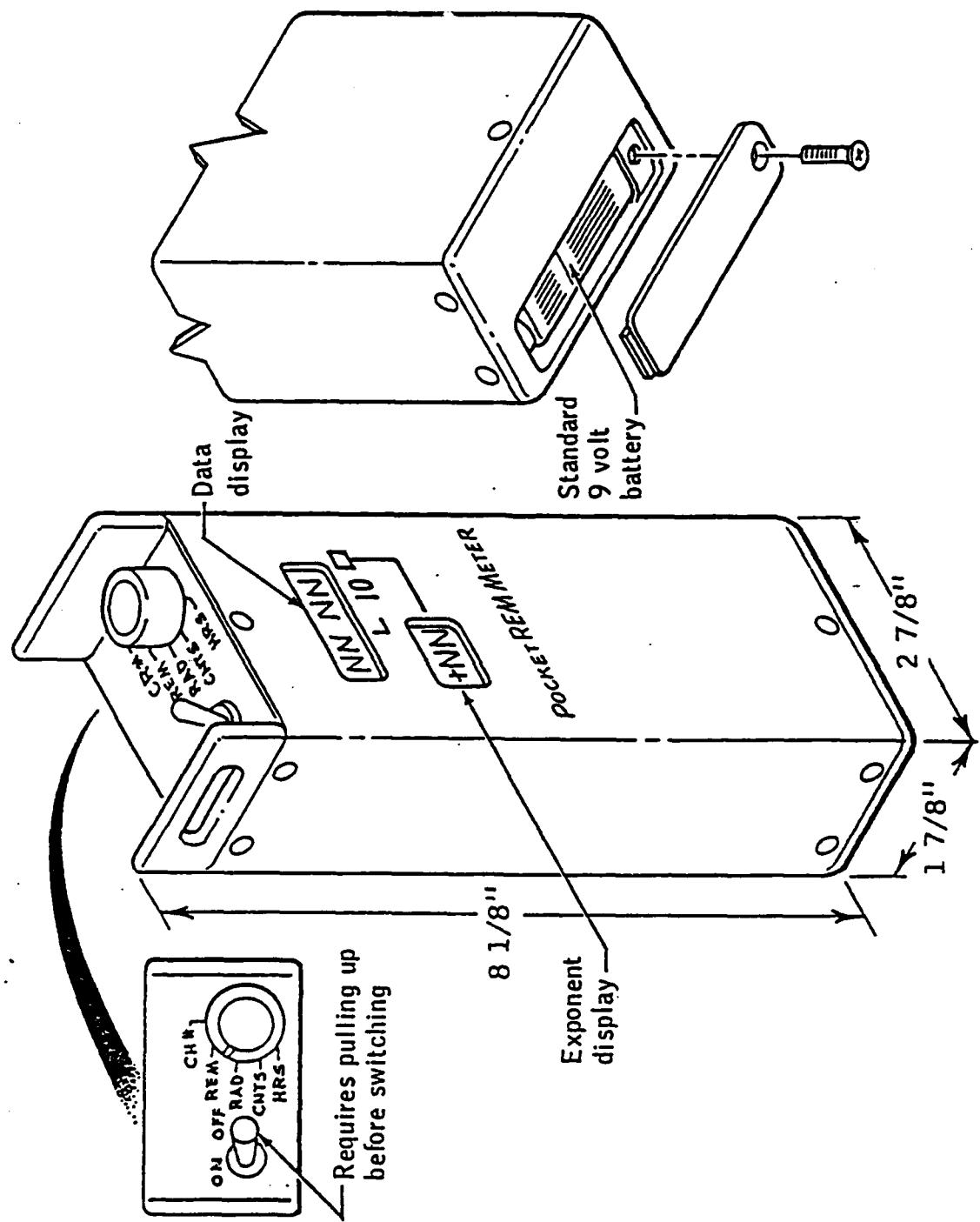
Figures 12, 14, 16, 18, 20, and 22 show average counts per second plotted on a world map. Figures 13, 15, 17, 19, 21, 23, and 24 show average counts per second plotted against elapsed time.

The most significant aspect of the data was seen in run #5 (Figures 20 and 21) when the Orbiter passed through the Southeast Asian Anomaly. Approximately midway through this data take, average count rate rose from 38 counts per second to a high of 117 counts per second and dropped back down to 59 counts per second during a period of 12.5 minutes.

Data from runs 1, 2, 3, 4, and 6 are unremarkable with average count rates ranging from a low of 21 counts per second to a high of 68 counts per second.

STS-41G.

The HRM-III was operated four times during STS-41G. Once again, the device performed well with no anomalies experienced.



Pocket REM Meter (PRM)

Figure 2.

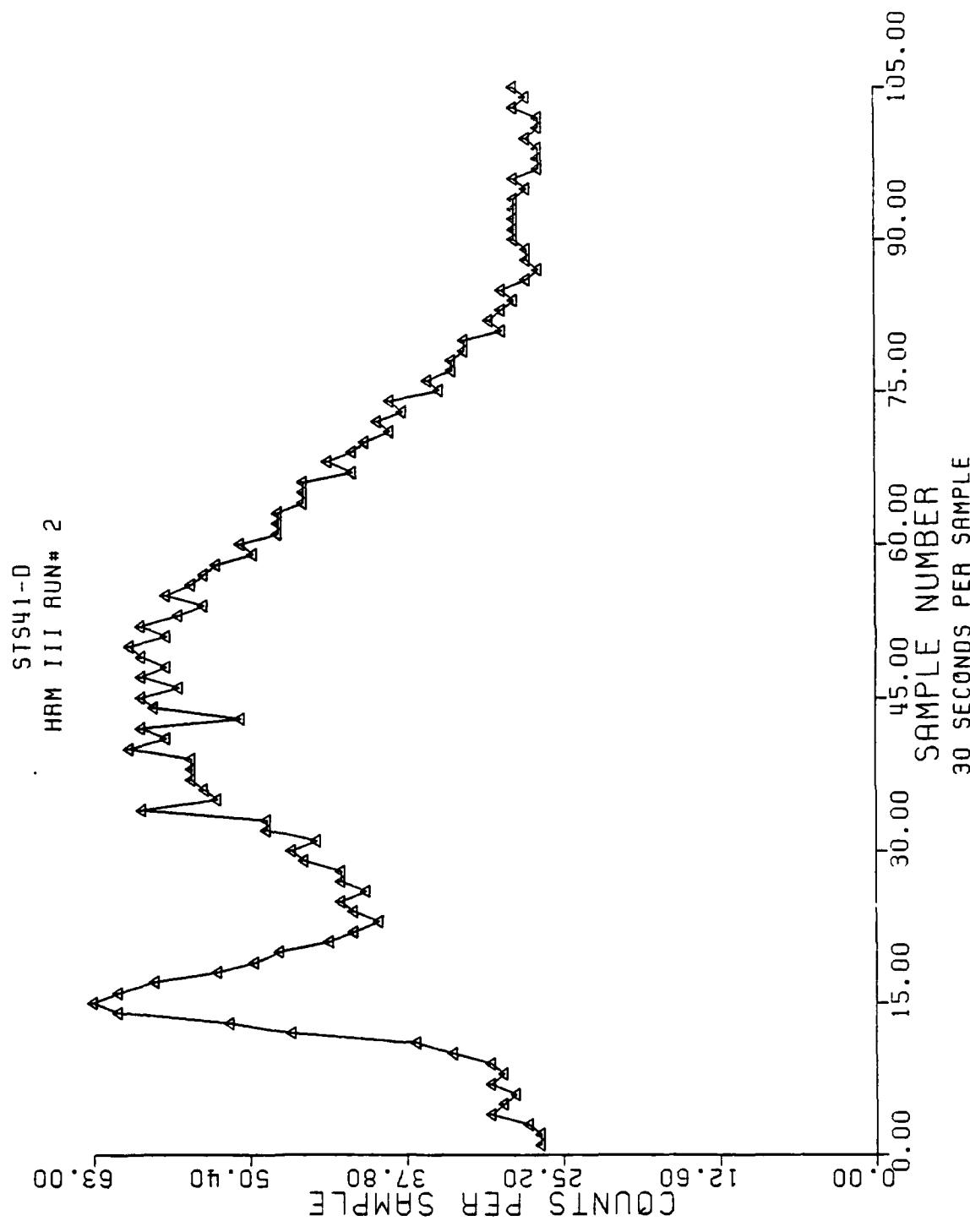
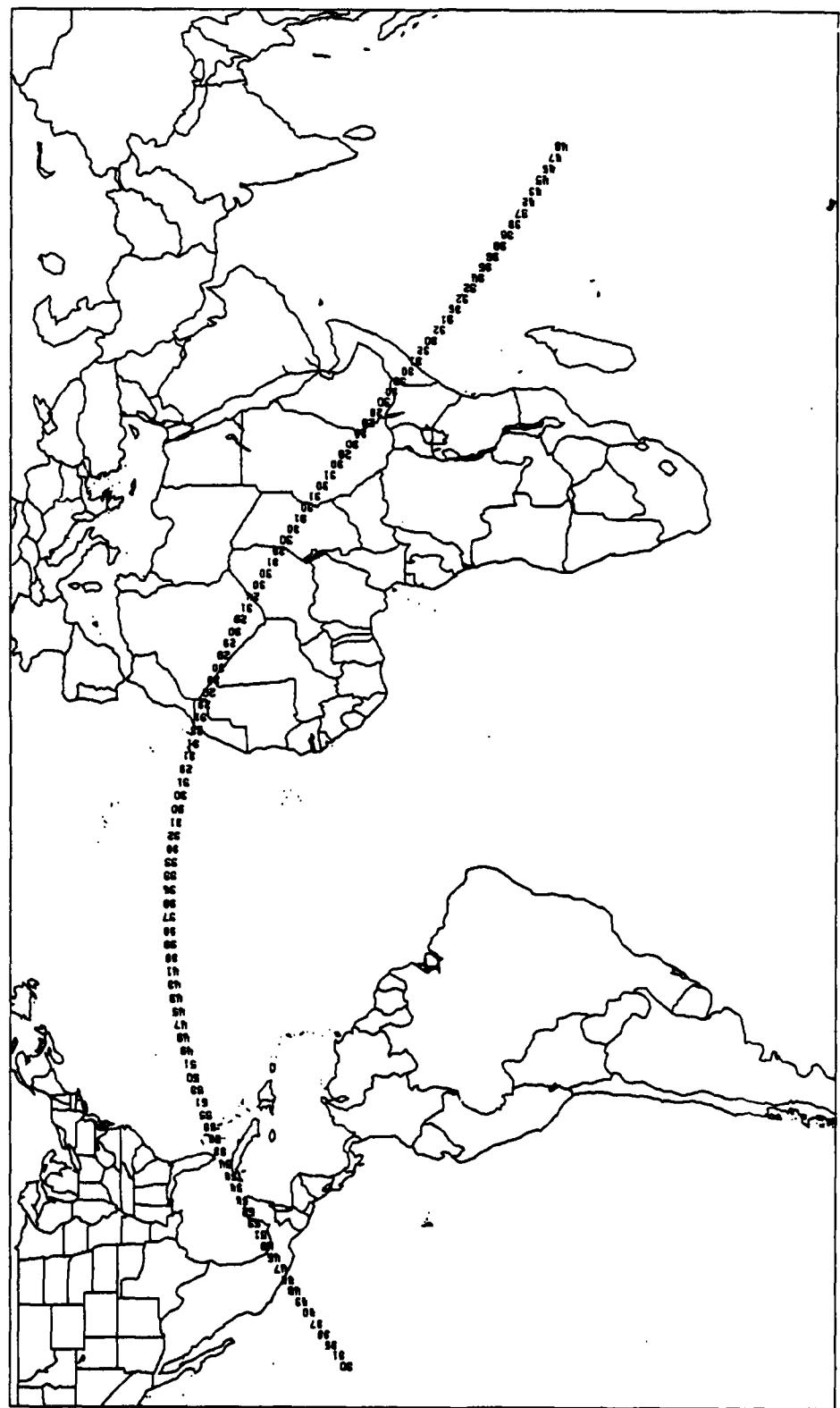


Figure 15

HRM-III

OPERATION NO. 3



STS41-D

Figure 16

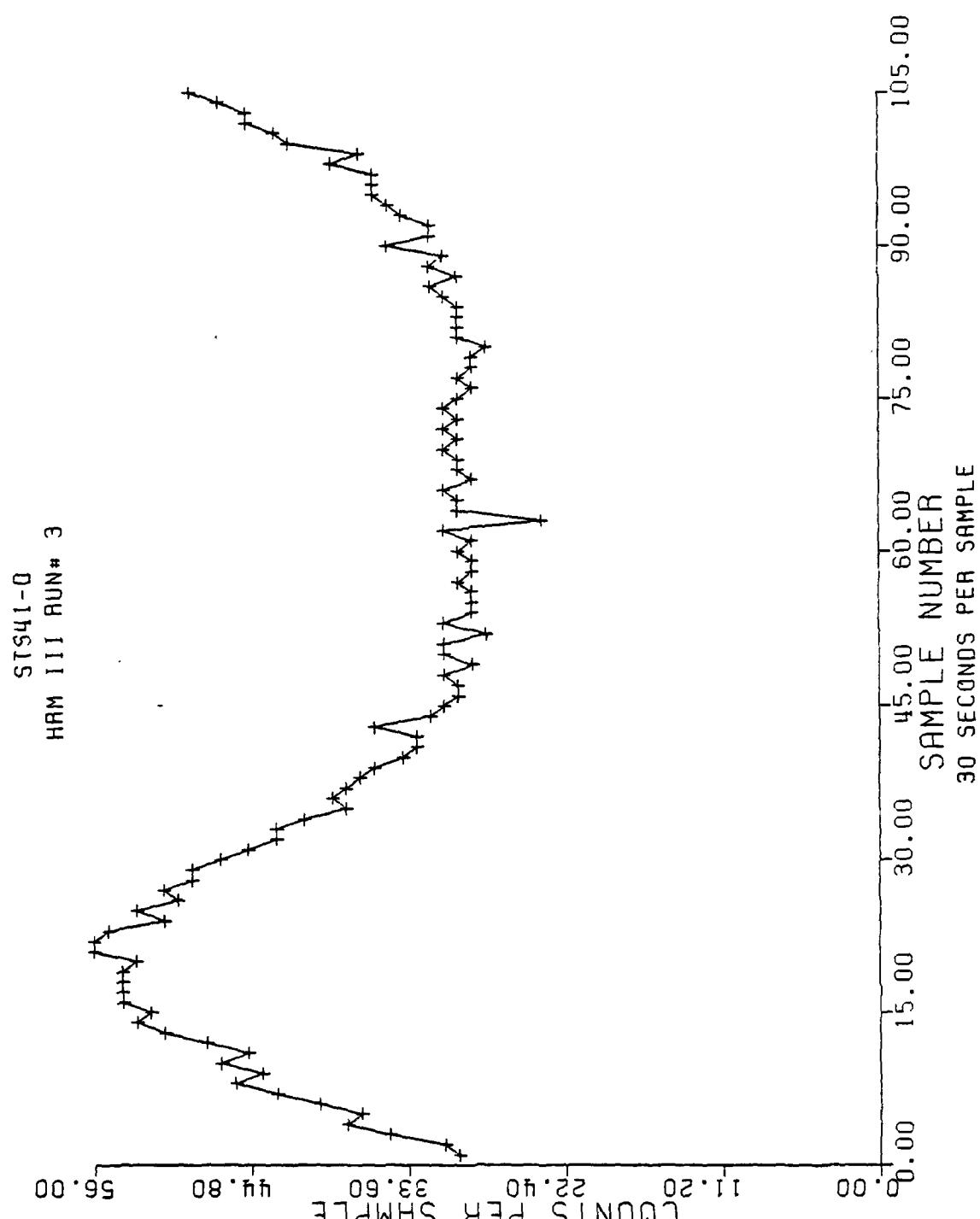
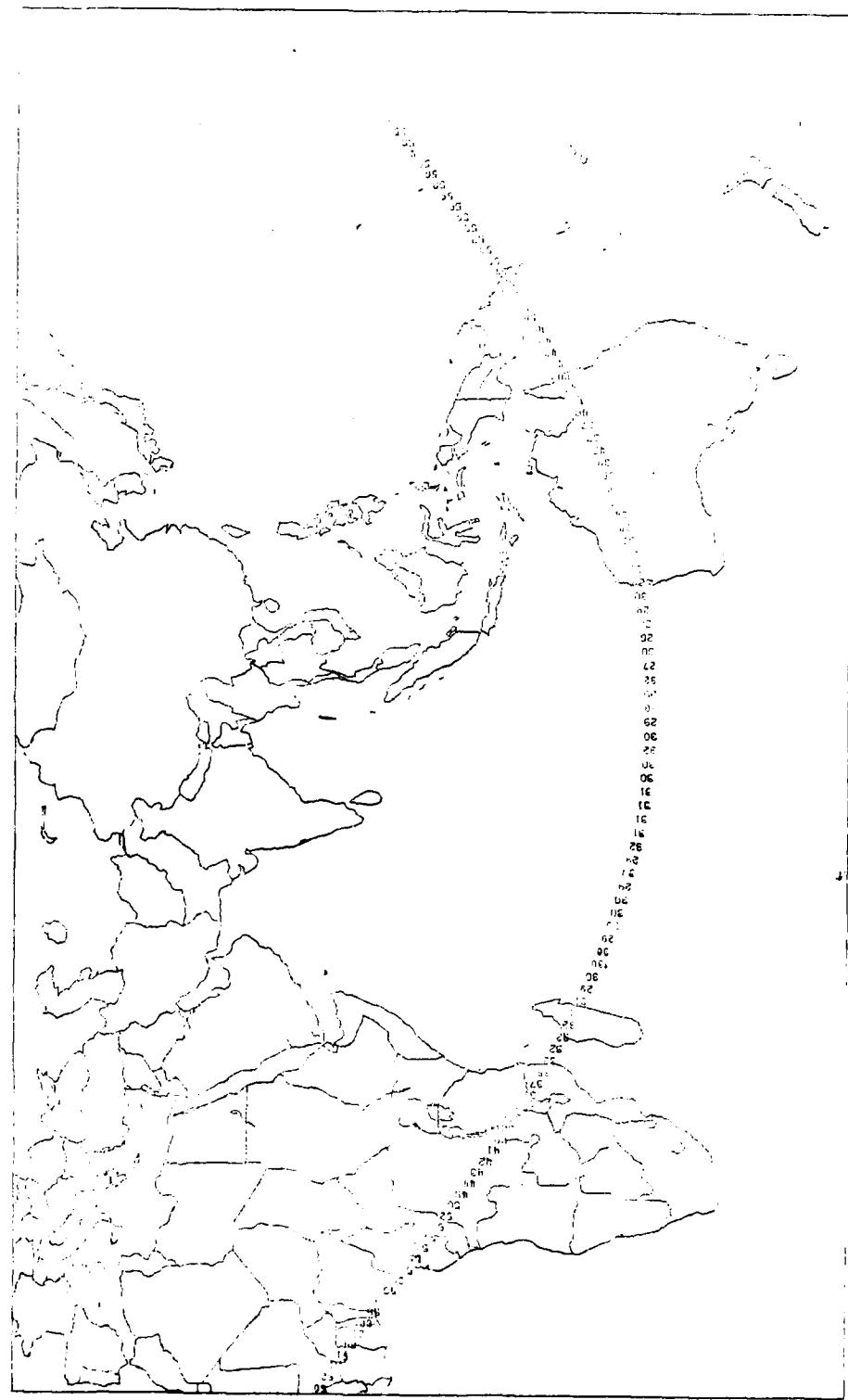


Figure 17

HRM-III

OPERATION N.J. 4



STS 1-D

Figure 18

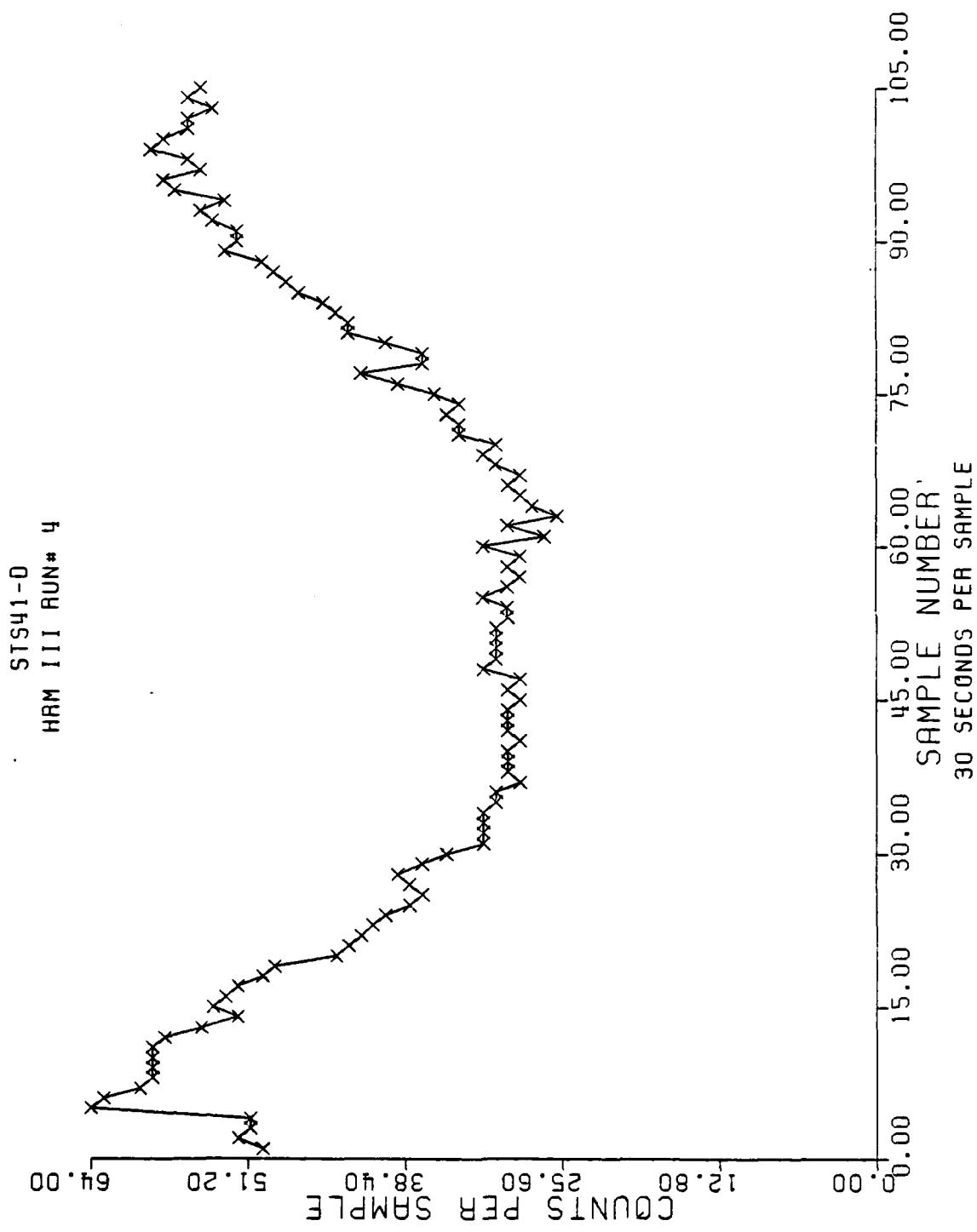


Figure 19

Fig. 20

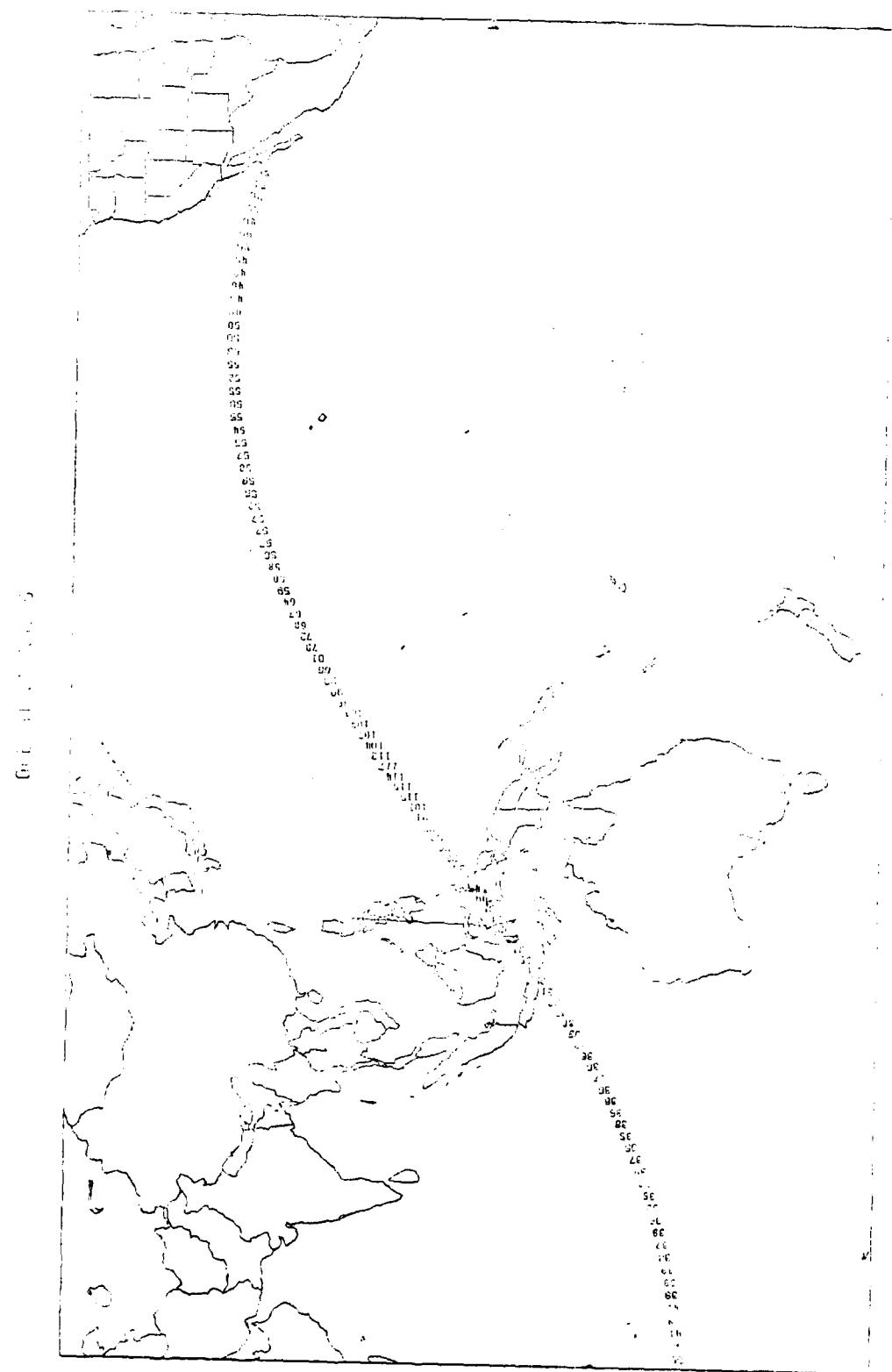


Figure 20

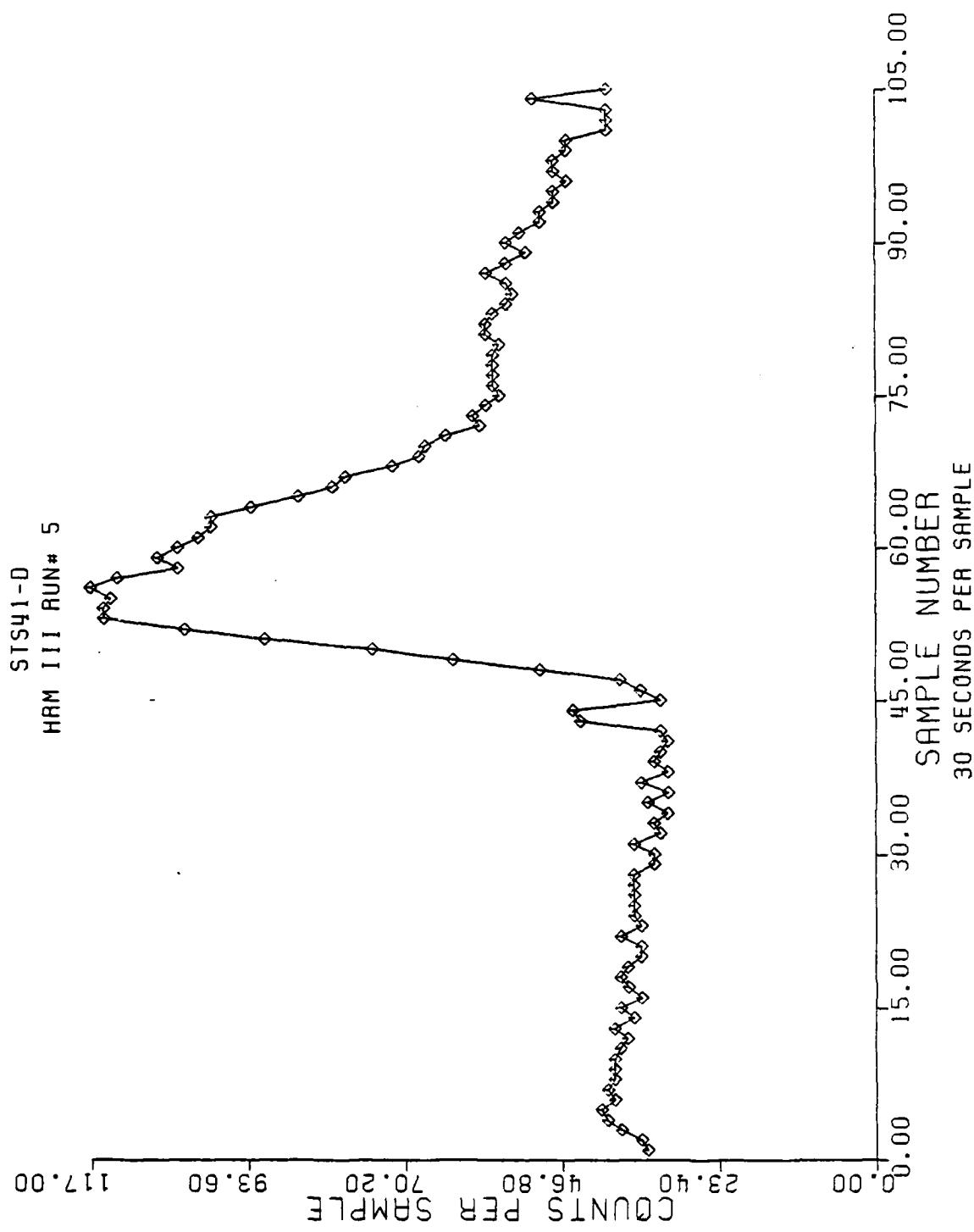


Figure 21

Hk. 111

67E 41134 N.J.



Figure 22

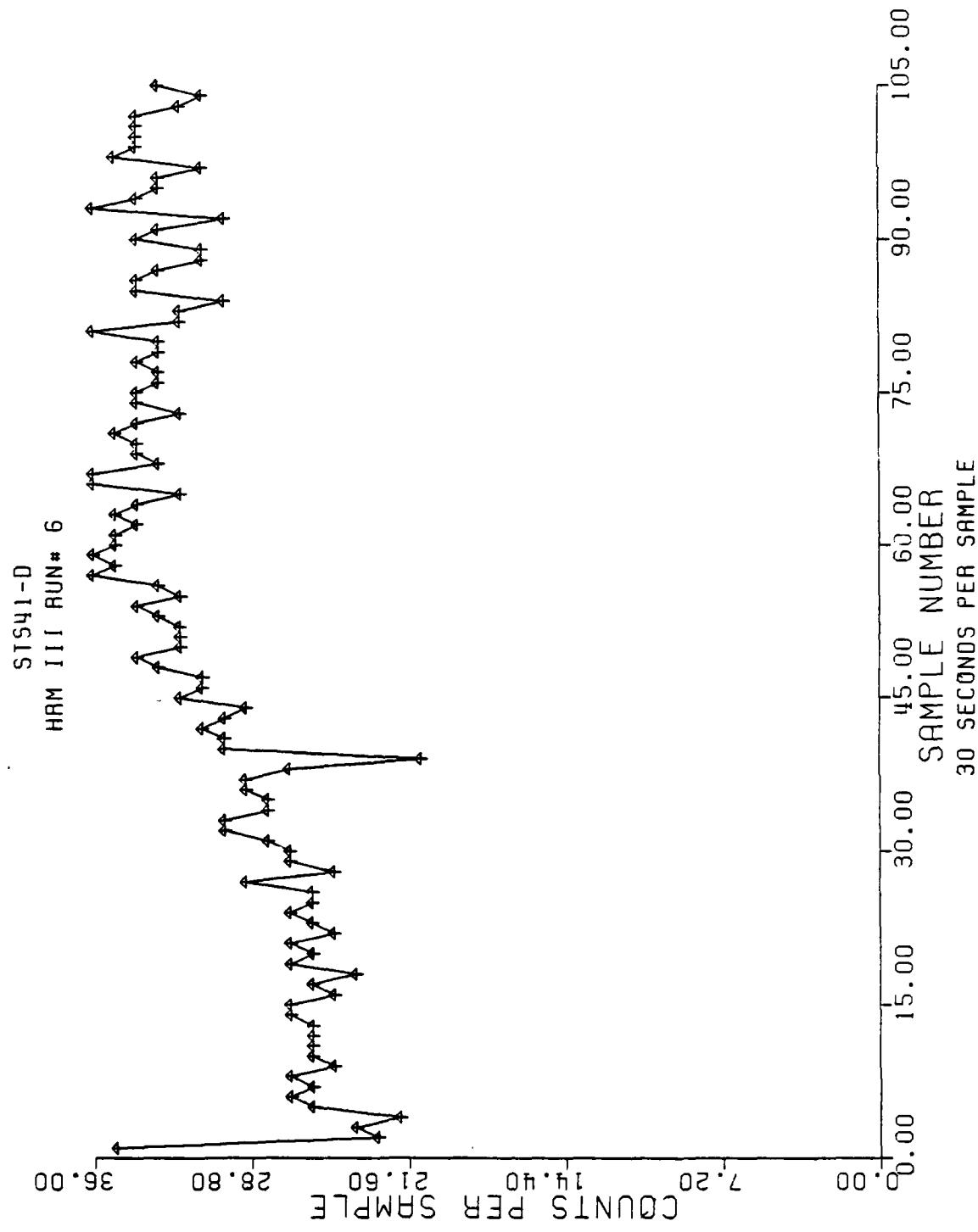


Figure 23

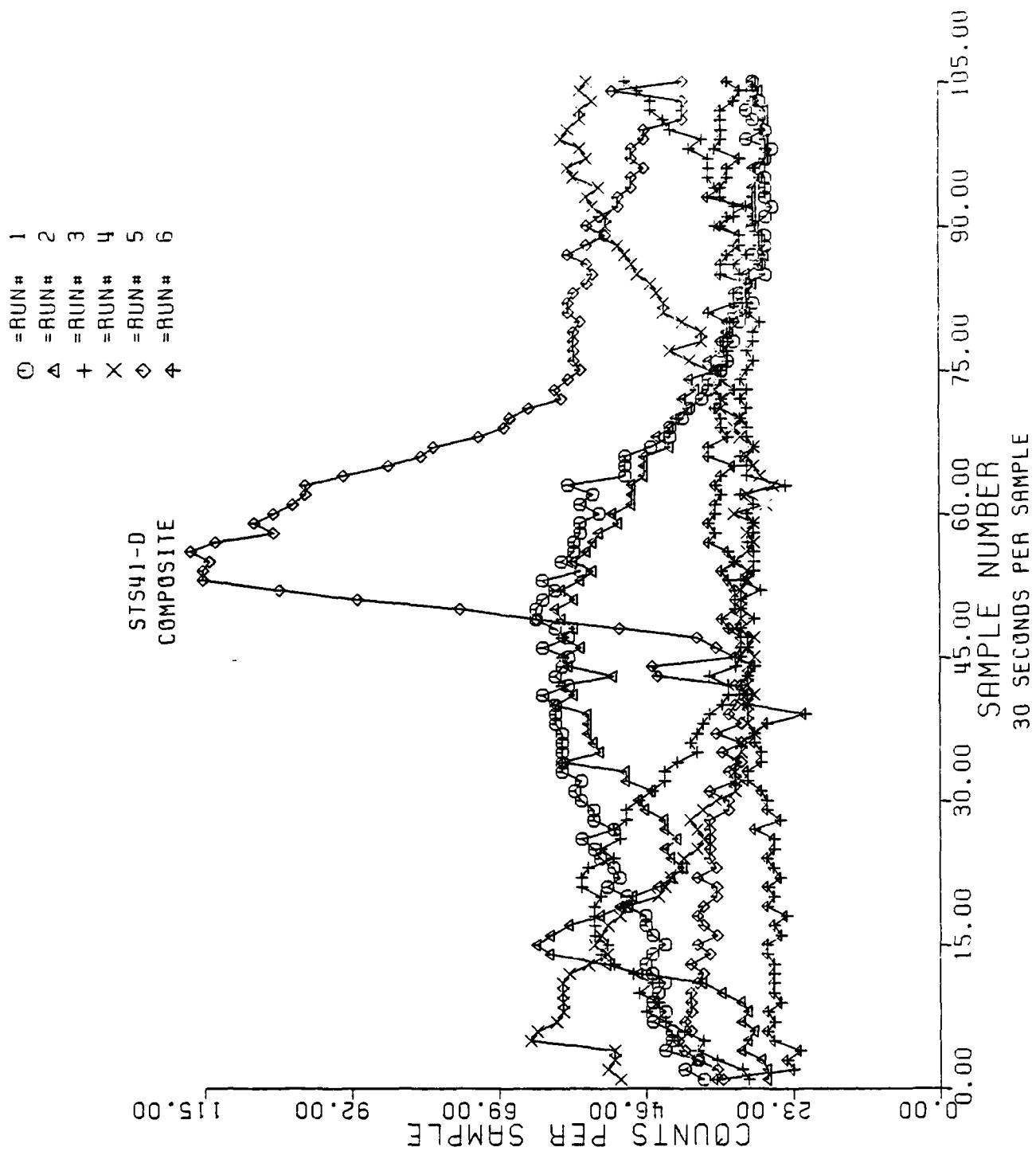


Figure 24

Figures 25, 27, 29, and 31 show average counts per second plotted on a world map. Figures 26, 28, 30, 32, and 33 show average counts per second plotted against elapsed time.

The inclination of the STS-41G orbit was 57°, whereas the inclinations of STS-41C, 41D, and 51A were 28.5°. Data taken at the higher latitudes covered by STS-41G show significantly higher count rates than those of the lower inclination orbits. There is a greater population of trapped particles at higher latitudes and the increased interaction of the particles with the Orbiter results in higher levels of nuclear radiation.

Another interesting characteristic of the data was seen during operation #1. Near the end of the data take, the average count rate increases dramatically to a high of 2518 counts per second. These readings, the highest of any of the RME Shuttle experiments are clearly the result of passing through the South Atlantic Anomaly.

During operation #3 (refer to figures 29 and 30), a severe spike in count rate occurred near the beginning of the run. The readings for four consecutive sampling periods were 324, 2227, 761, and 146 counts per second. The unusual appearance, that is the narrow width of the spike, is attributed to the effect of the 30 second sampling period of the HRM-III as configured for these experiments. Better resolution of this data would have required a finer sampling rate.

STS-51A.

The STS-51A crew performed four HRM-III operations. No anomalies were experienced.

Figures 34, 36, 38, and 40 show average counts per second plotted on a world map. Figures 35, 37, 39, 41, and 42 show average counts per second plotted against elapsed time.

For the most part, HRM-III data from this flight are unremarkable. Average count rates for the four operations range from a low of 23 counts per second to a high of 63 counts per second. A pass through the Southeast Asian Anomaly is evident in operation number one where average count rate climbs gradually from 27 counts per second over Australia to a high of 58 counts per second and then falls down to 31 counts per second near the Pacific coast of Mexico (see figure 34).

PRM.

During the STS-41C, 41D, 41G, and 51A flights, ten PRM operations were attempted. The first operation during STS-41C failed, presumably due to a low battery. All other data takes were successful. PRM data are presented in tables 1 through 8.

PRM operations on all four flights lasted between 7.95 and 17.65 hours. Average dose rates for these operations ranged between .211 mrem/hr (.021 mrad/hr) and 1.2421 mrem/hr (.1025 mrad/hr), and estimated total mission

HRM-111

OPERATION NO. 1

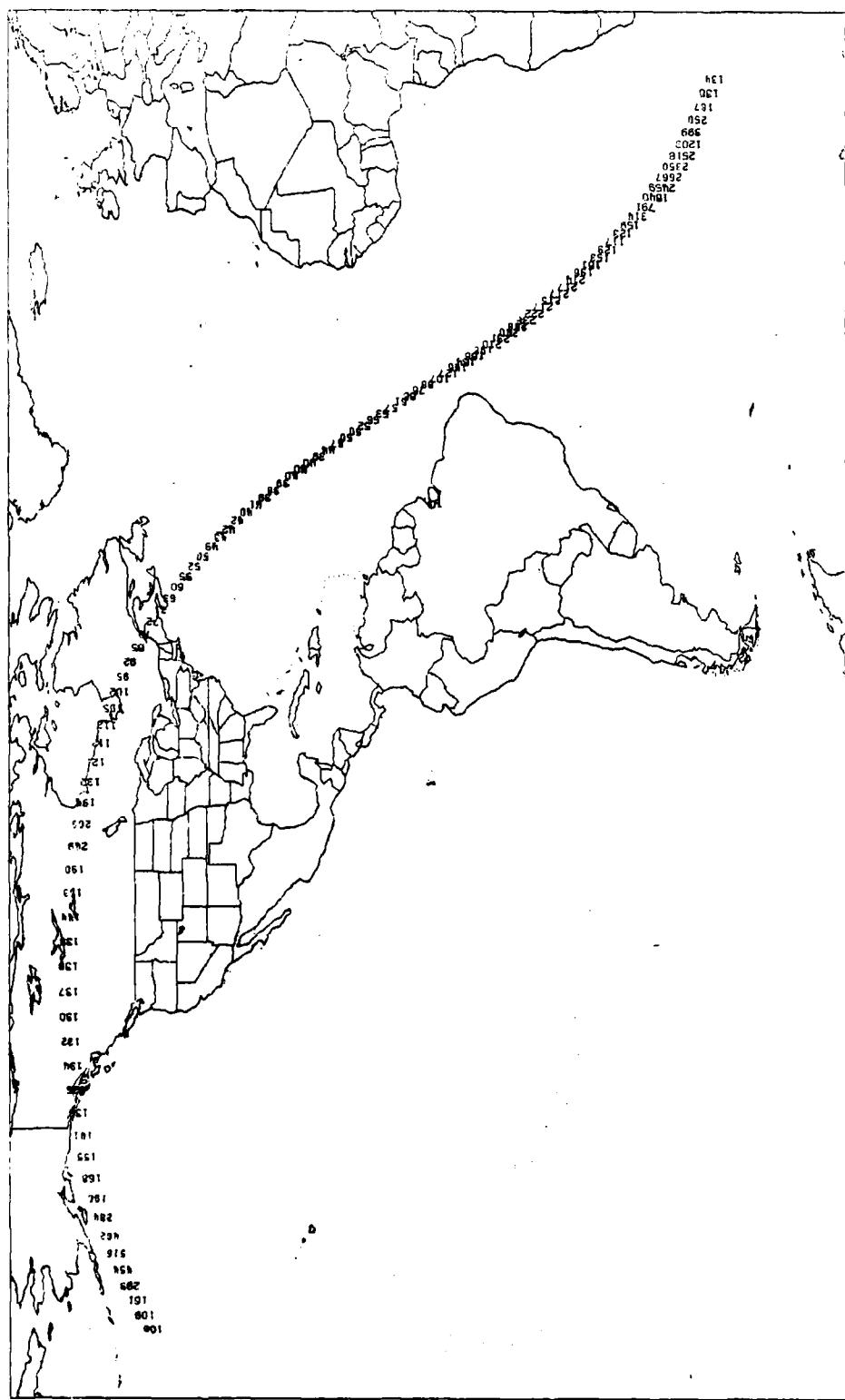


Figure 25

STS41-6
HAM III RUN# 1

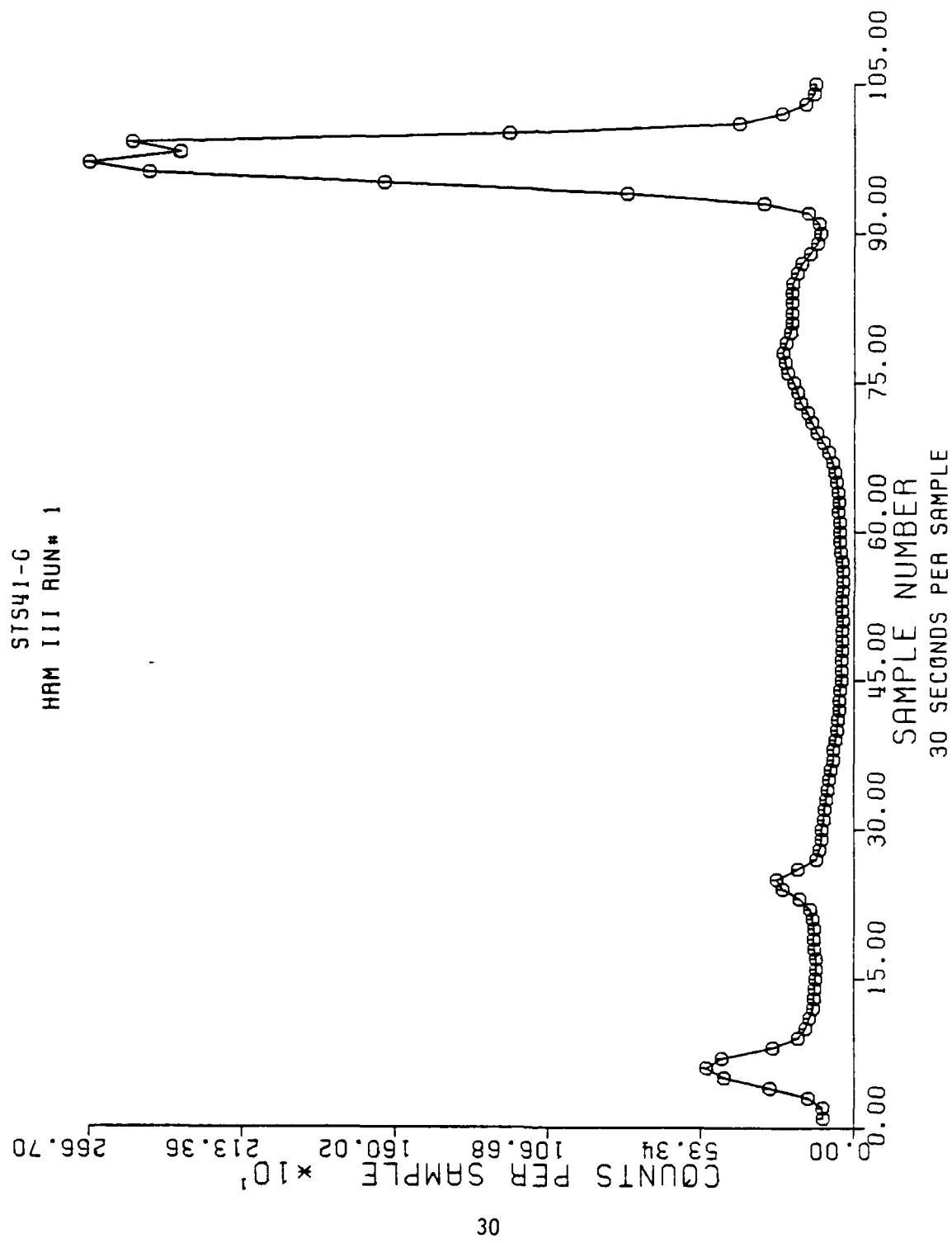


Figure 26

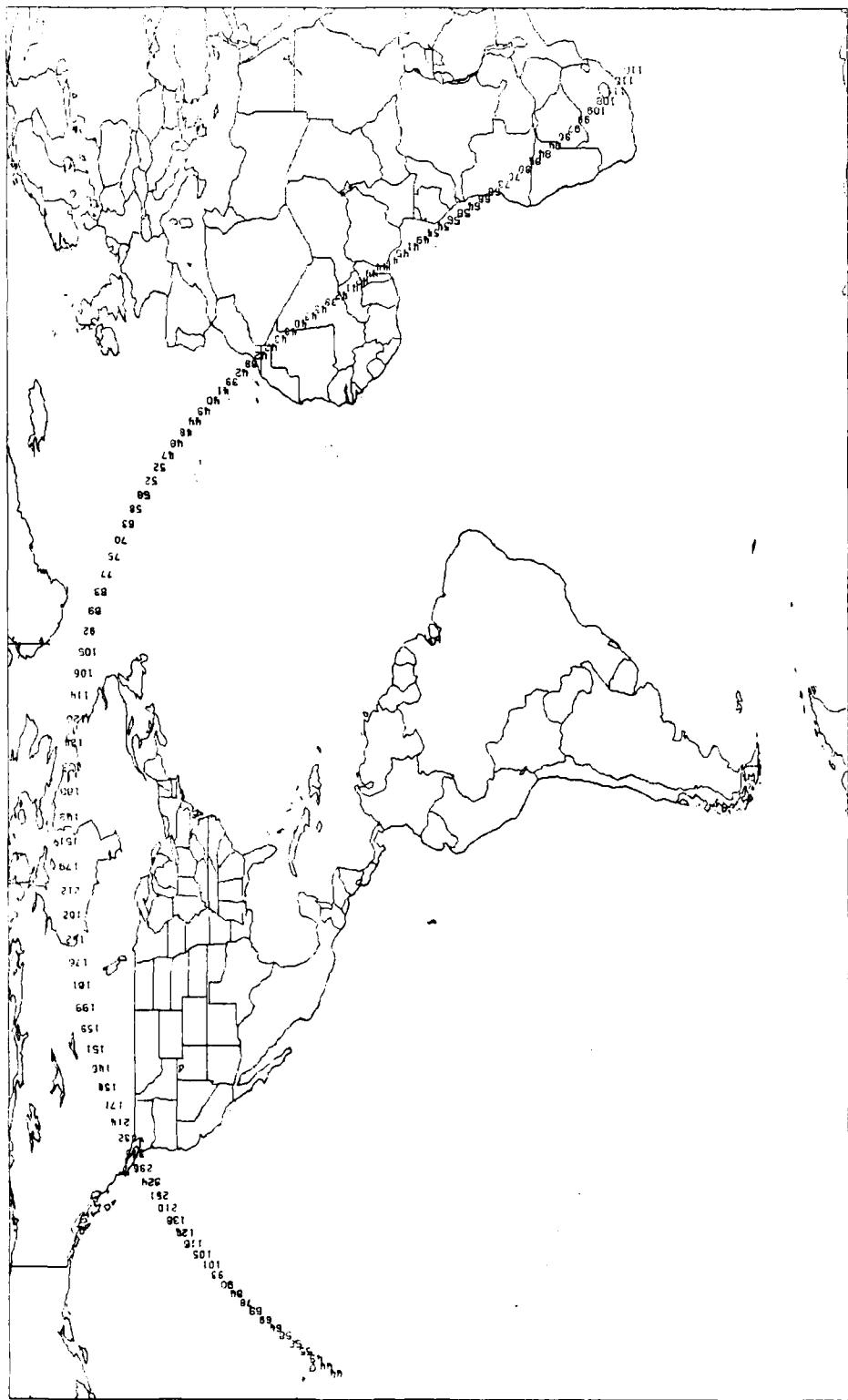


Figure 27

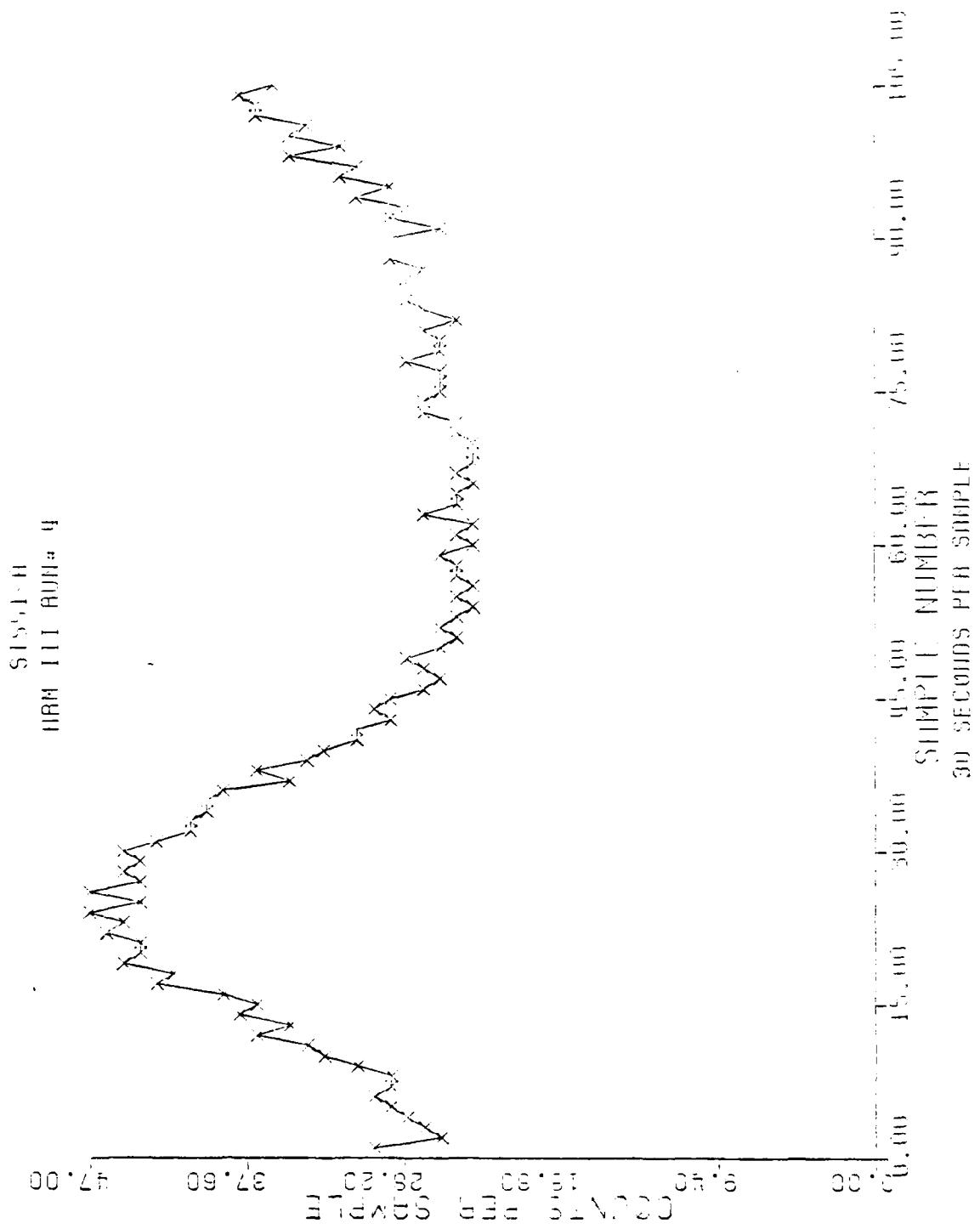
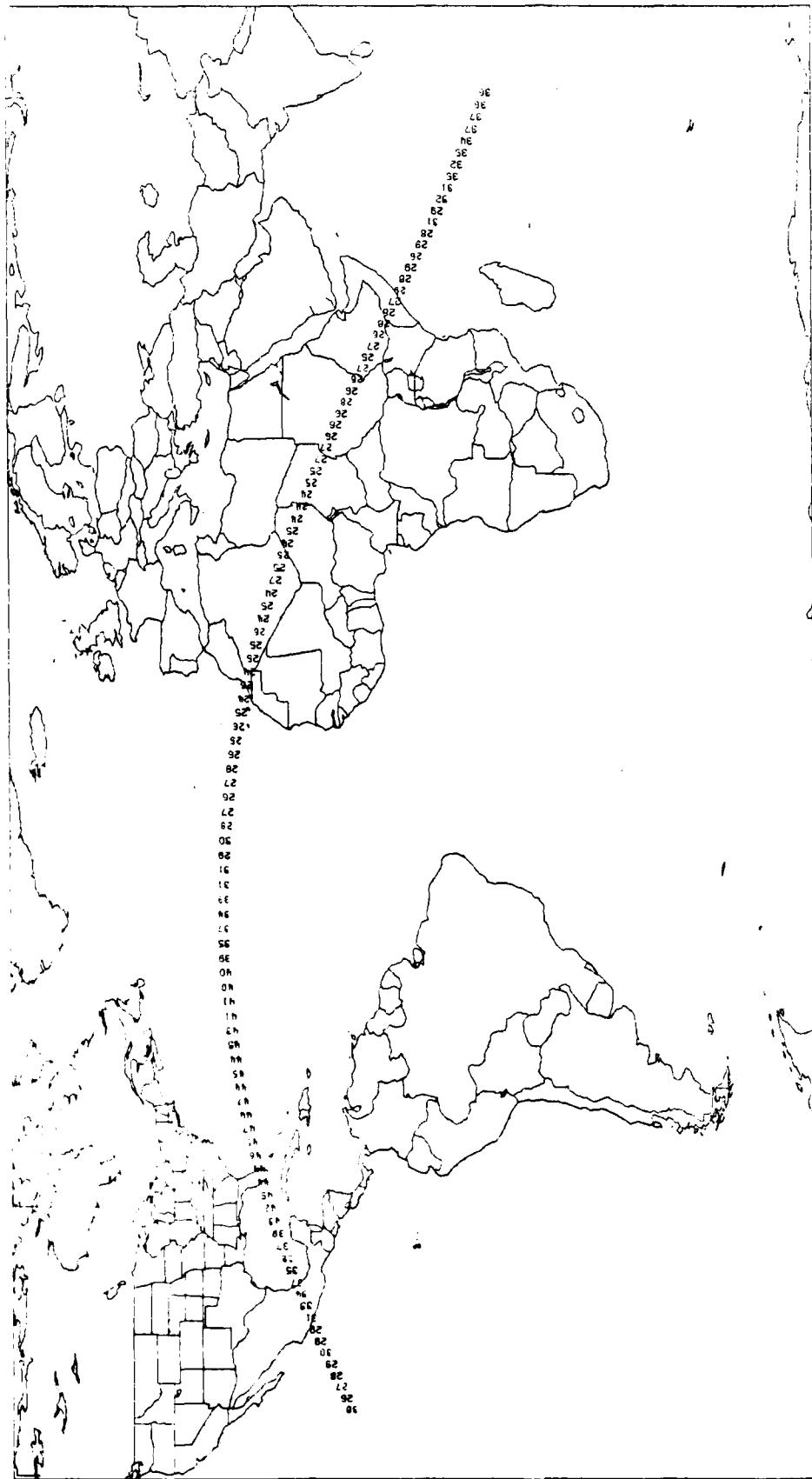


Figure 41

HRM-III

OPERATION NO. 4



STS-51A

Figure 40

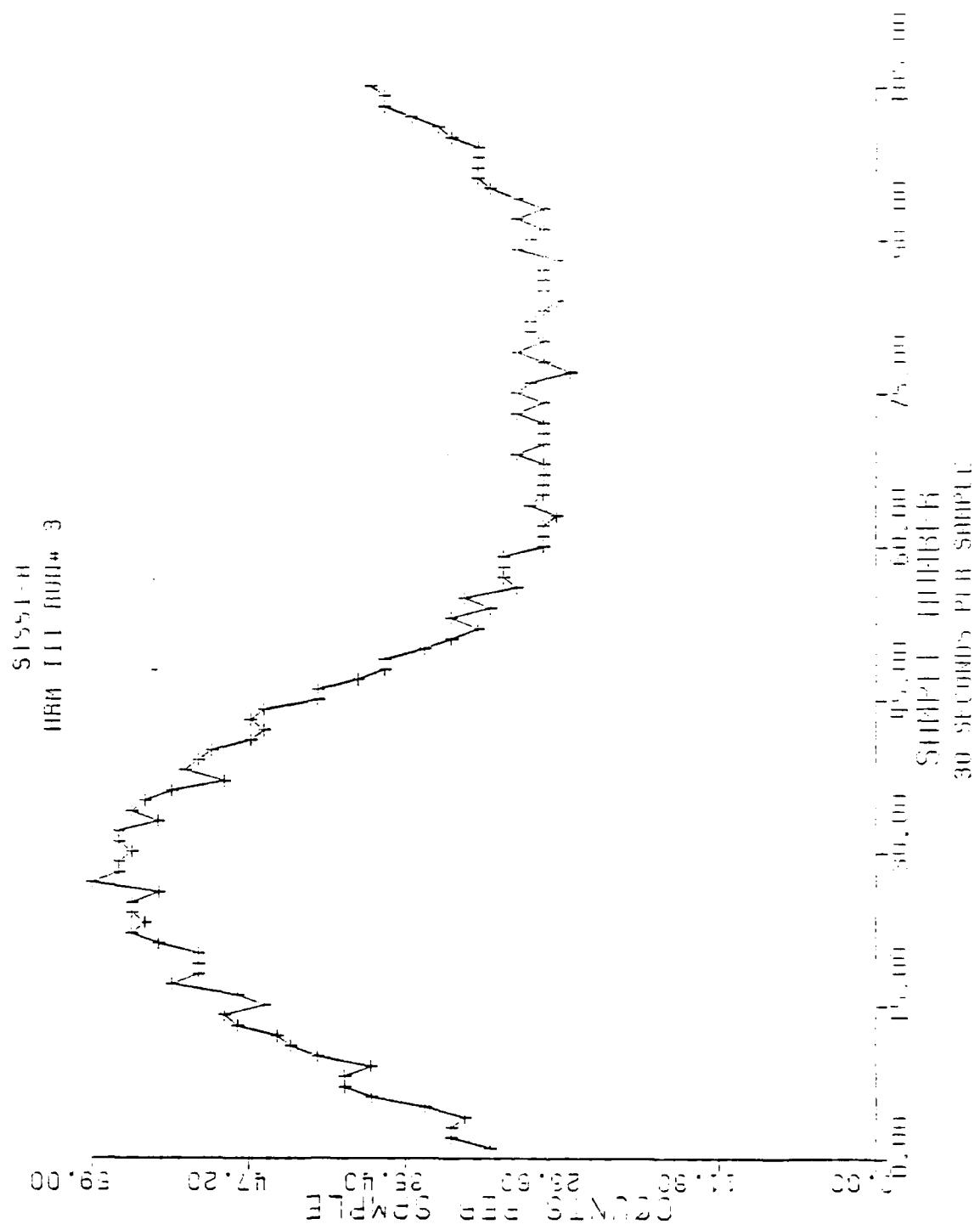


Figure 39

HFM-III

OPERATION NO. 3

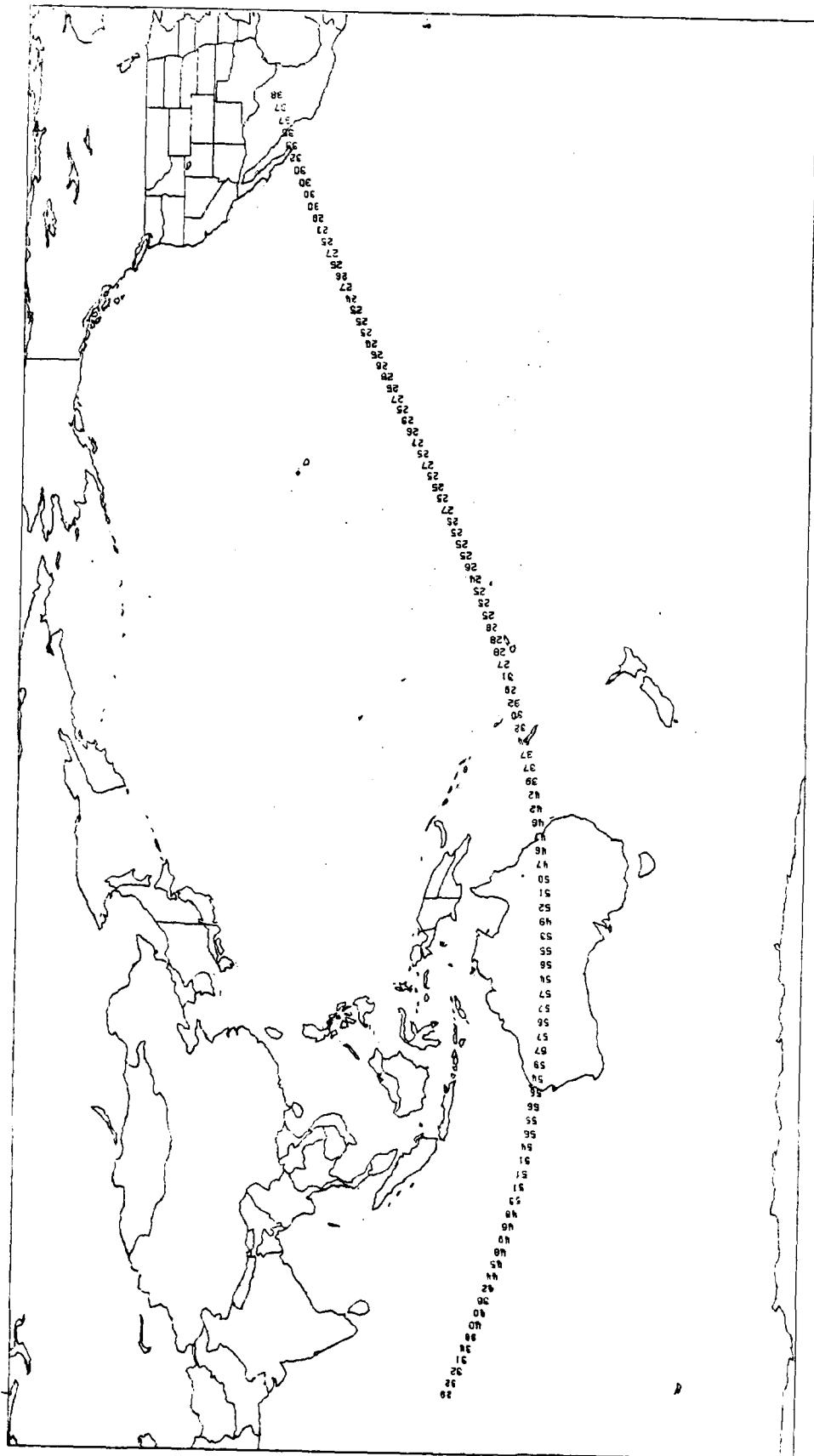


Figure 38

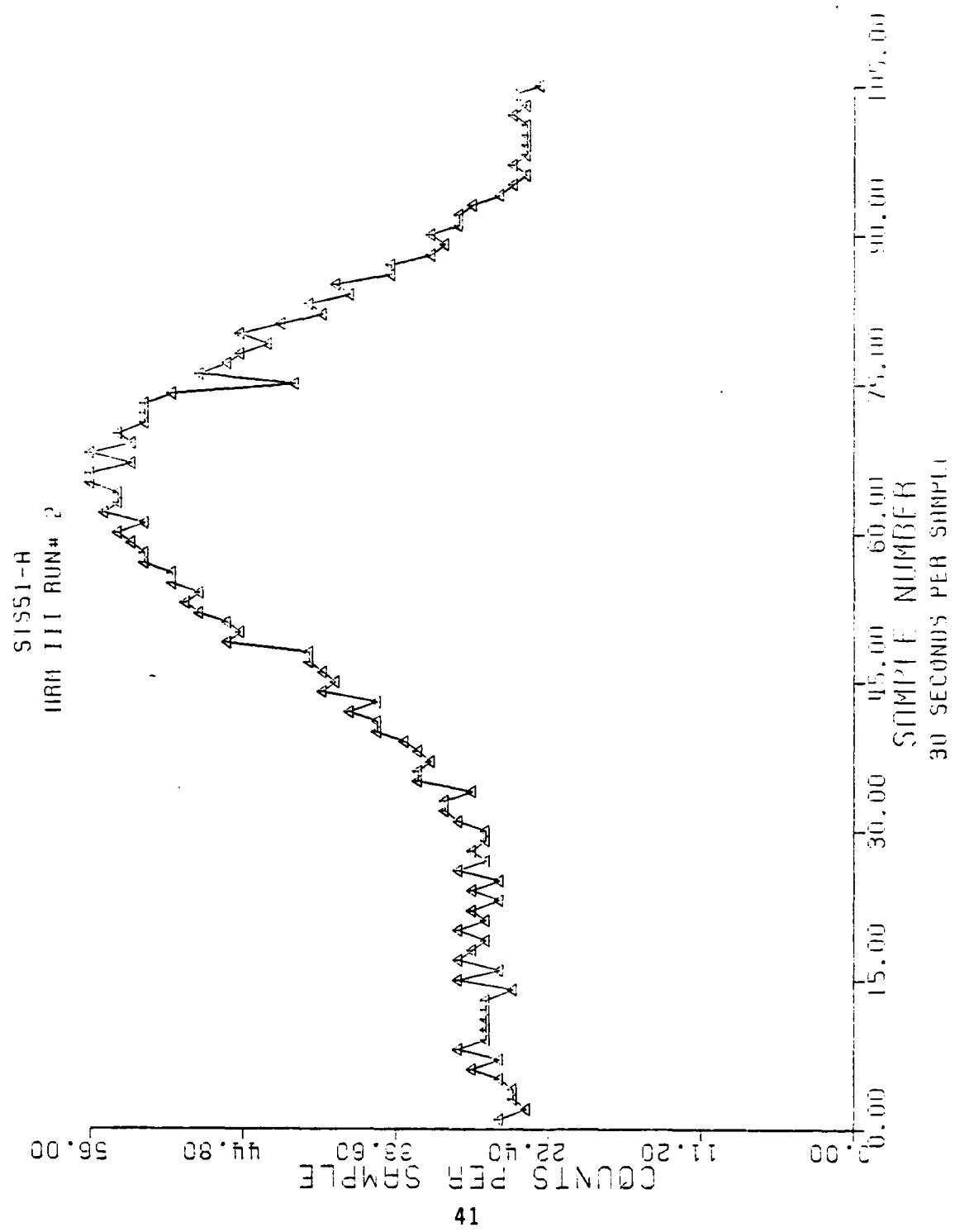


Figure 37

HRM-III

OPERATION NO. 2

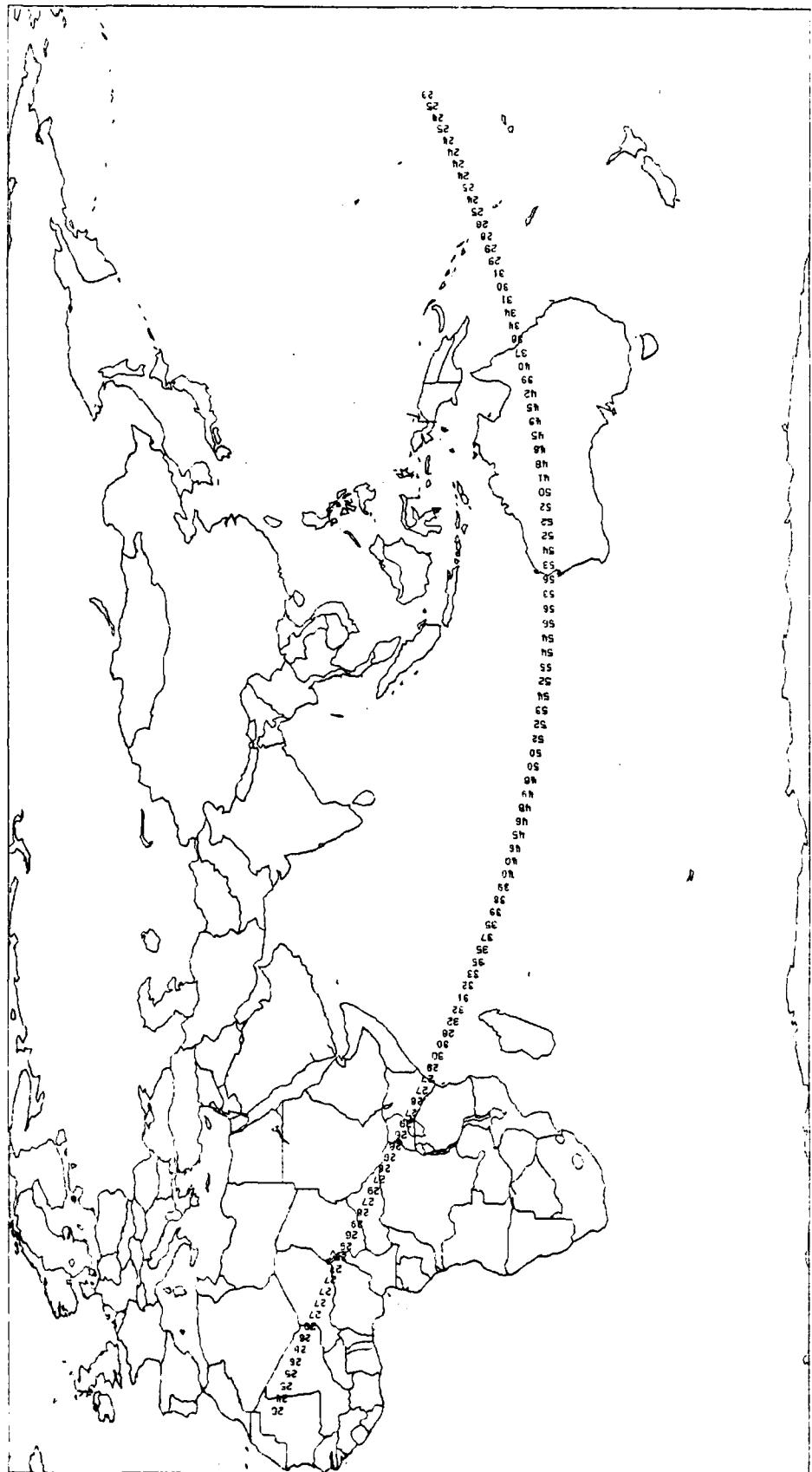


Figure 36

SISS1-H
IRN III RUN# 1

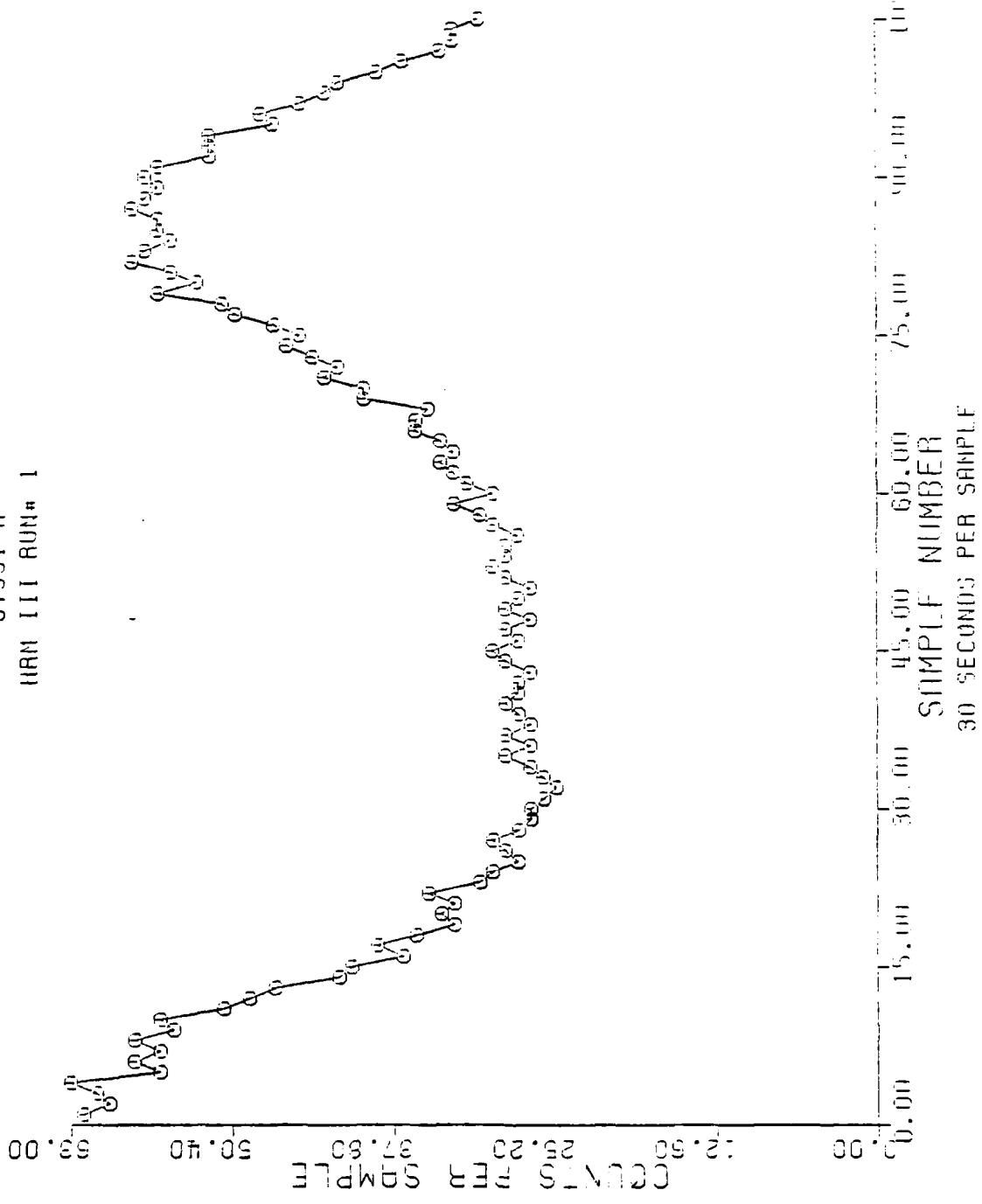
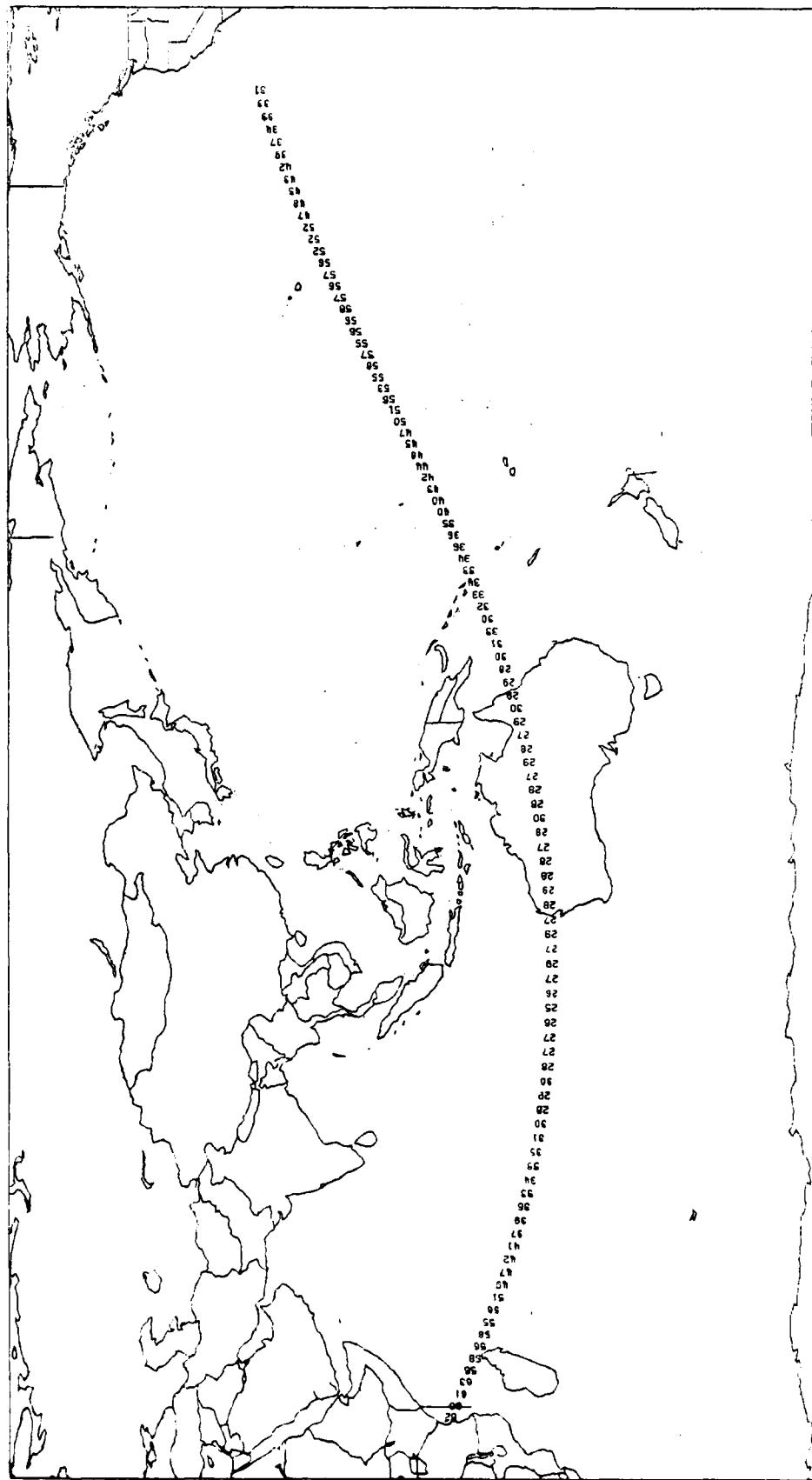


Figure 35

HJM-111

OPERATION NO. 1



512-519

Figure 34

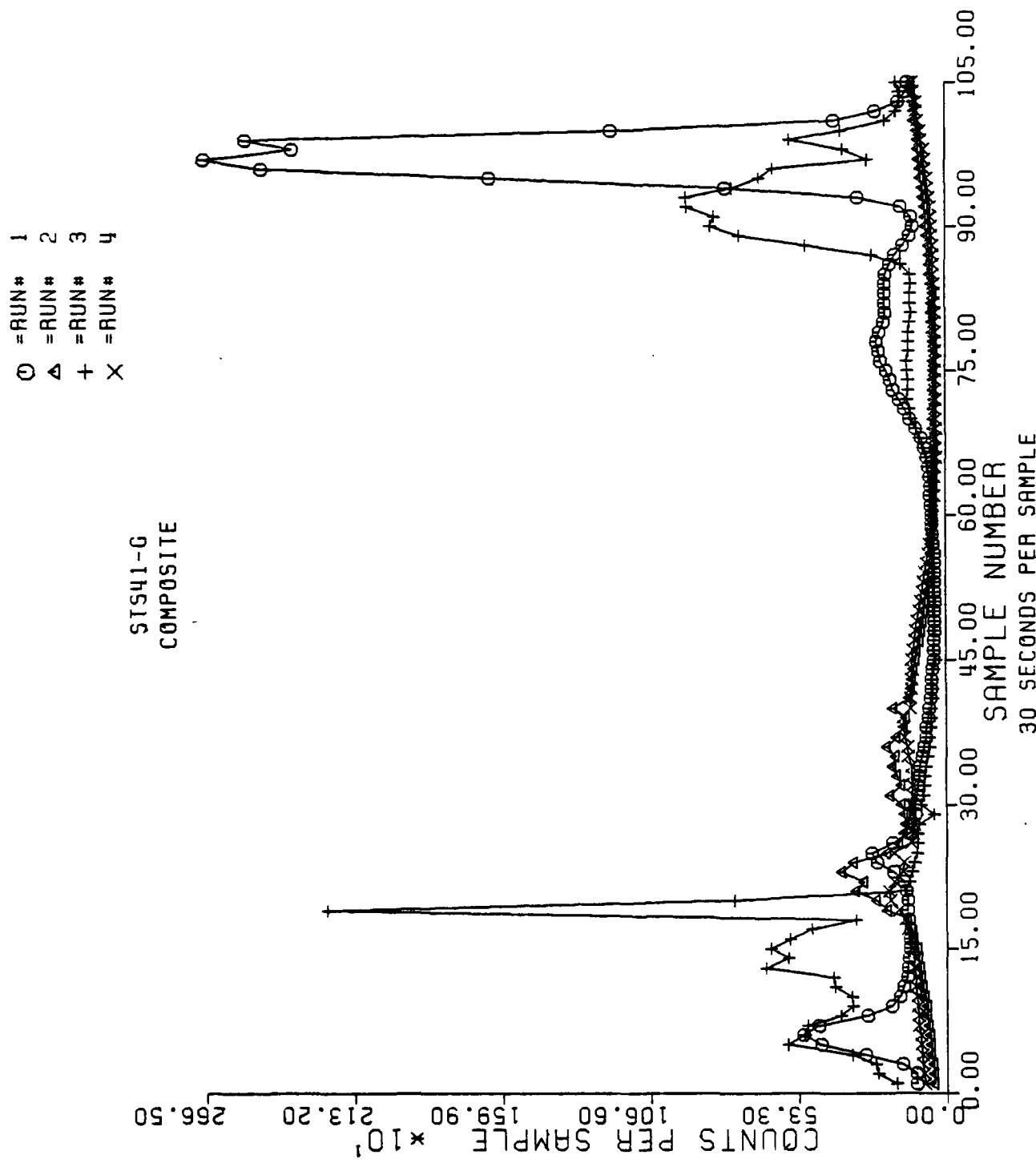


Figure 33

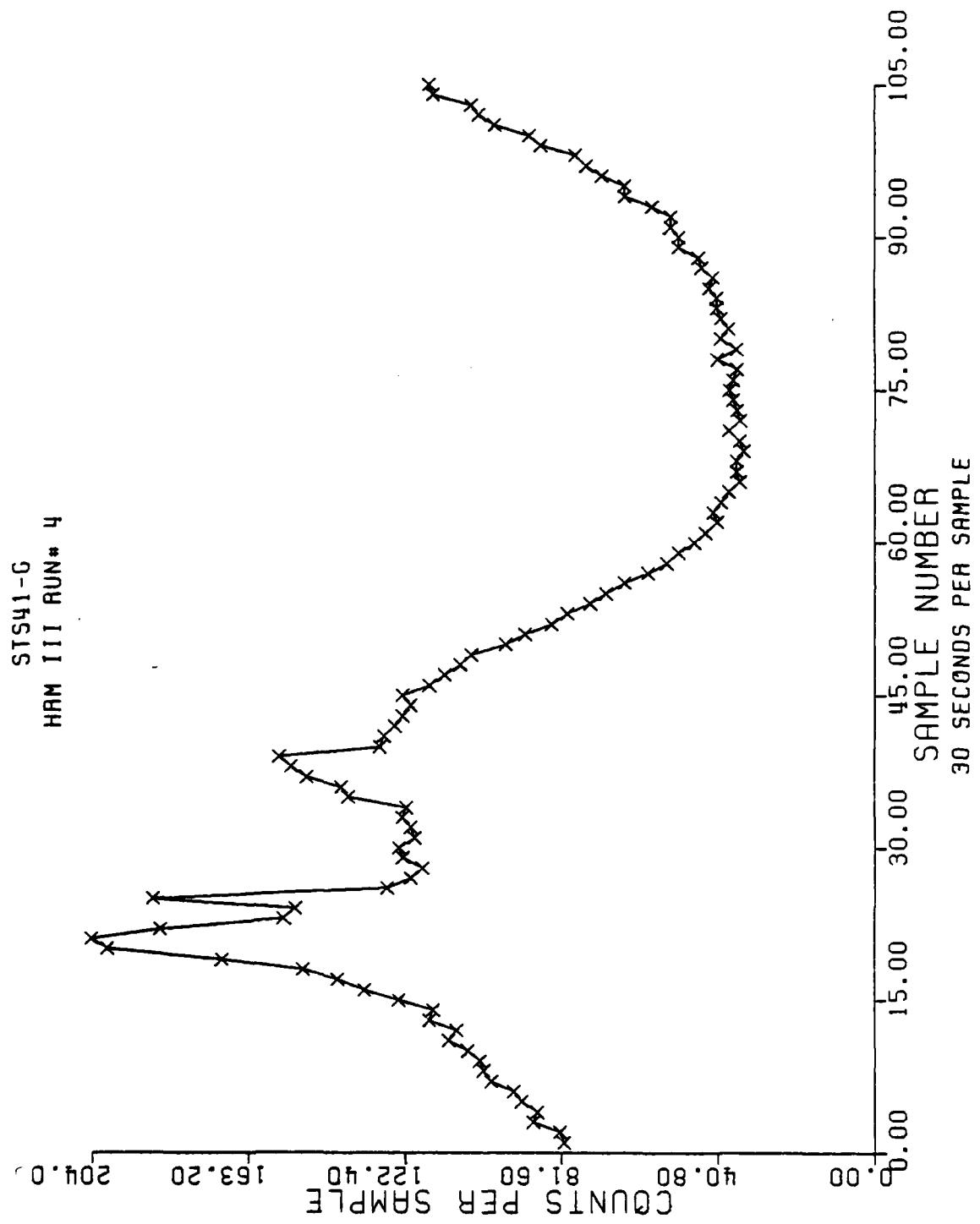
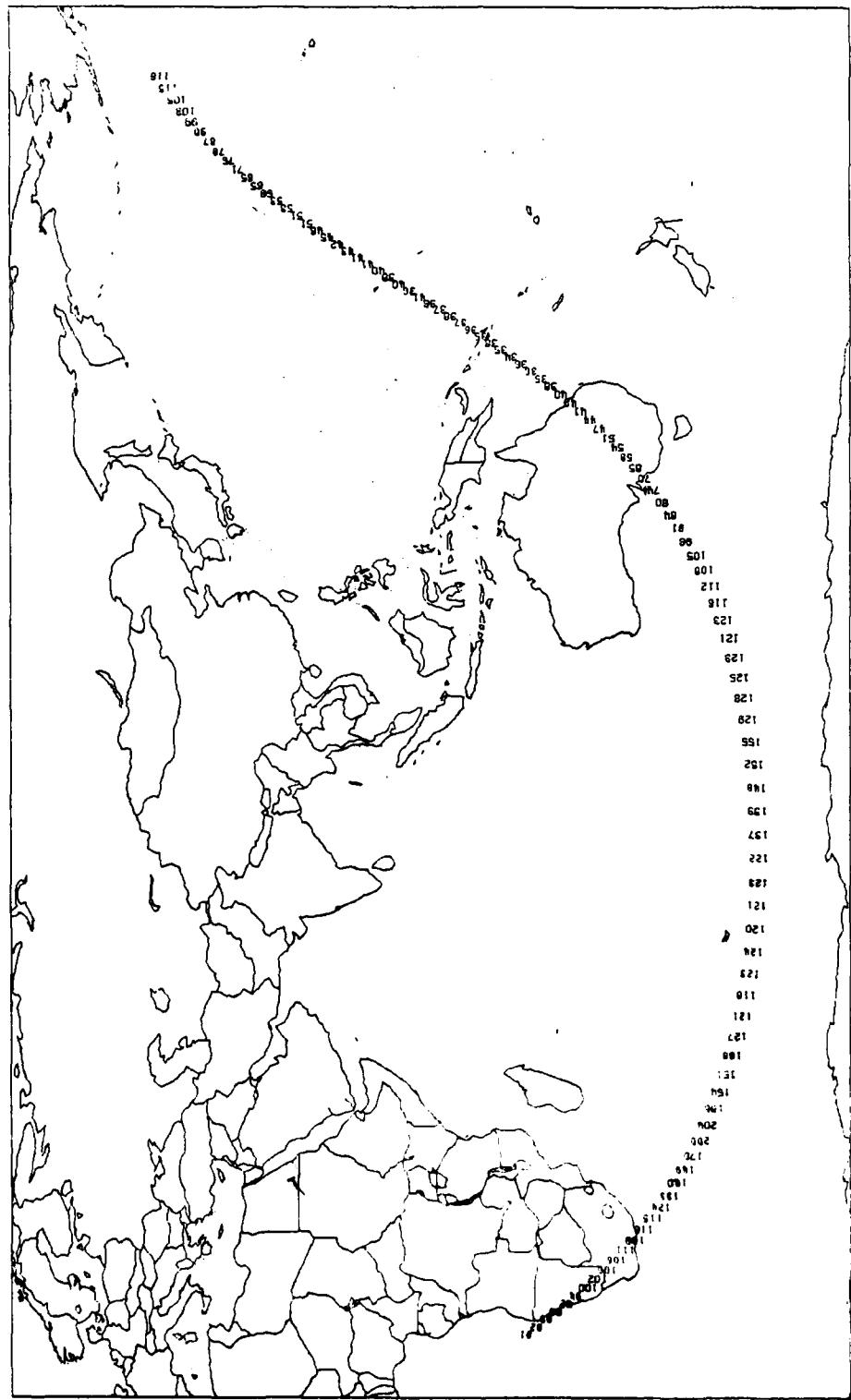


Figure 32

HRM-III

OPERATION NO. 4



STS41-6

Figure 31

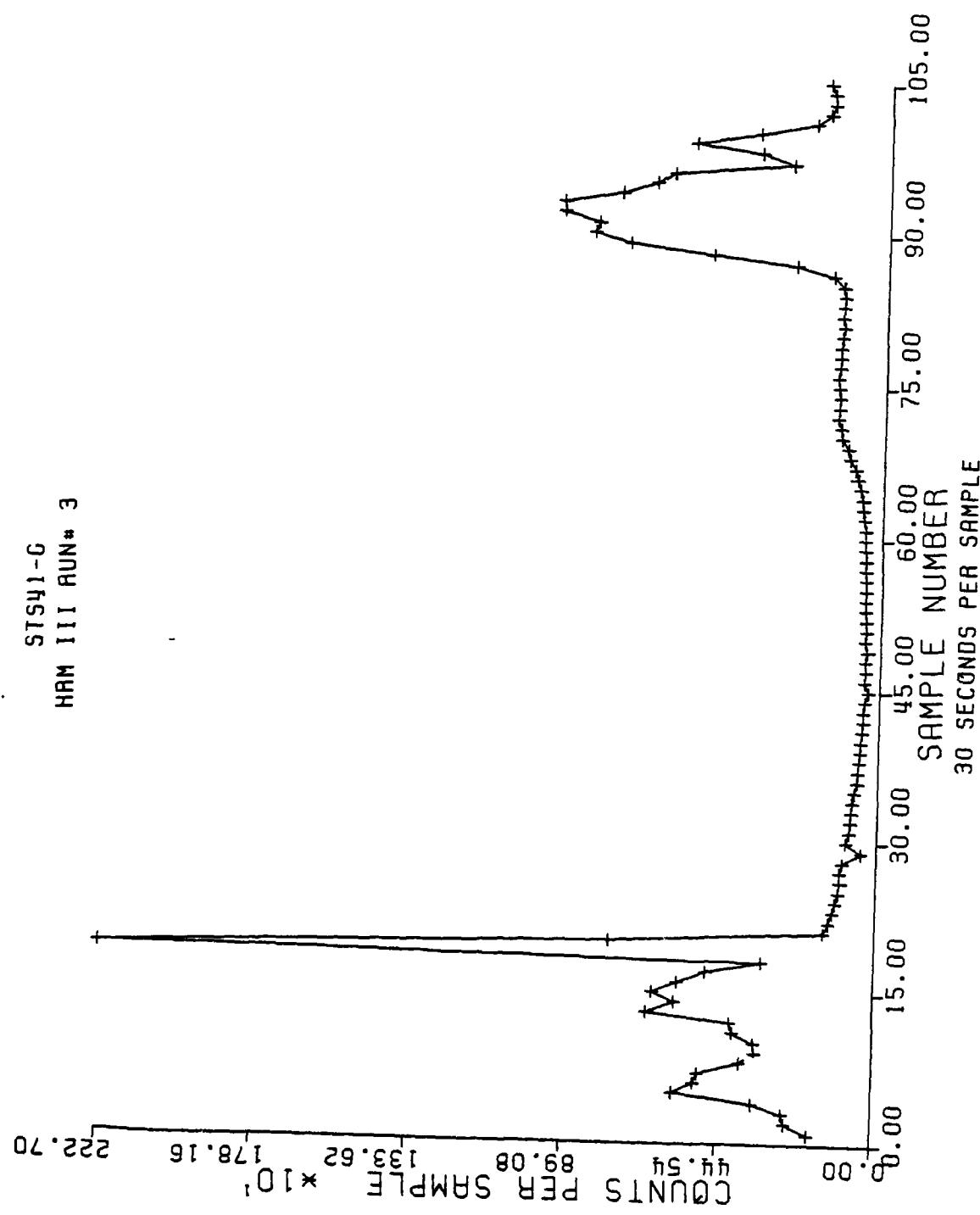
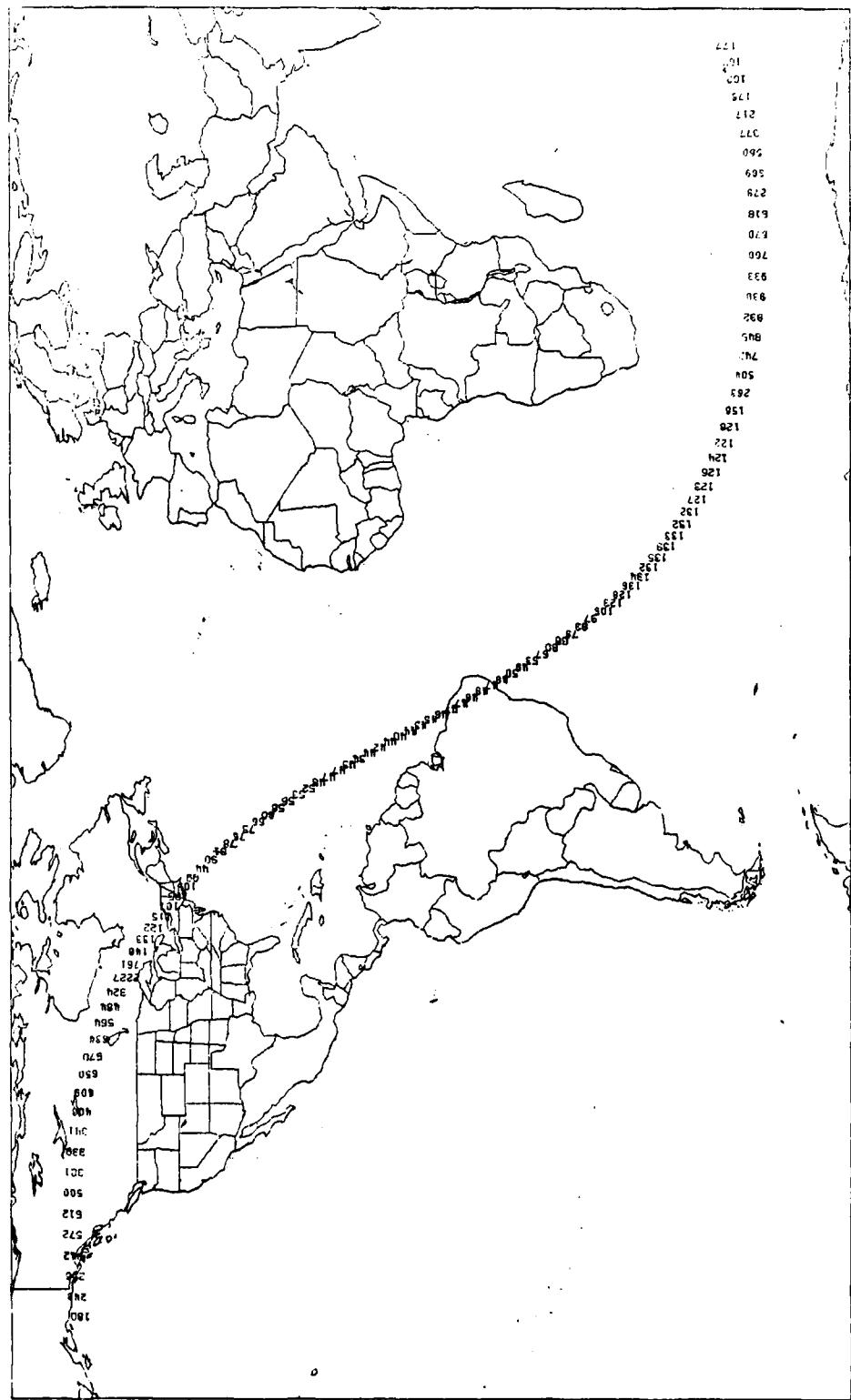


Figure 30

HRN-111

OPERATION NO. 3



STS41-6

Figure 29

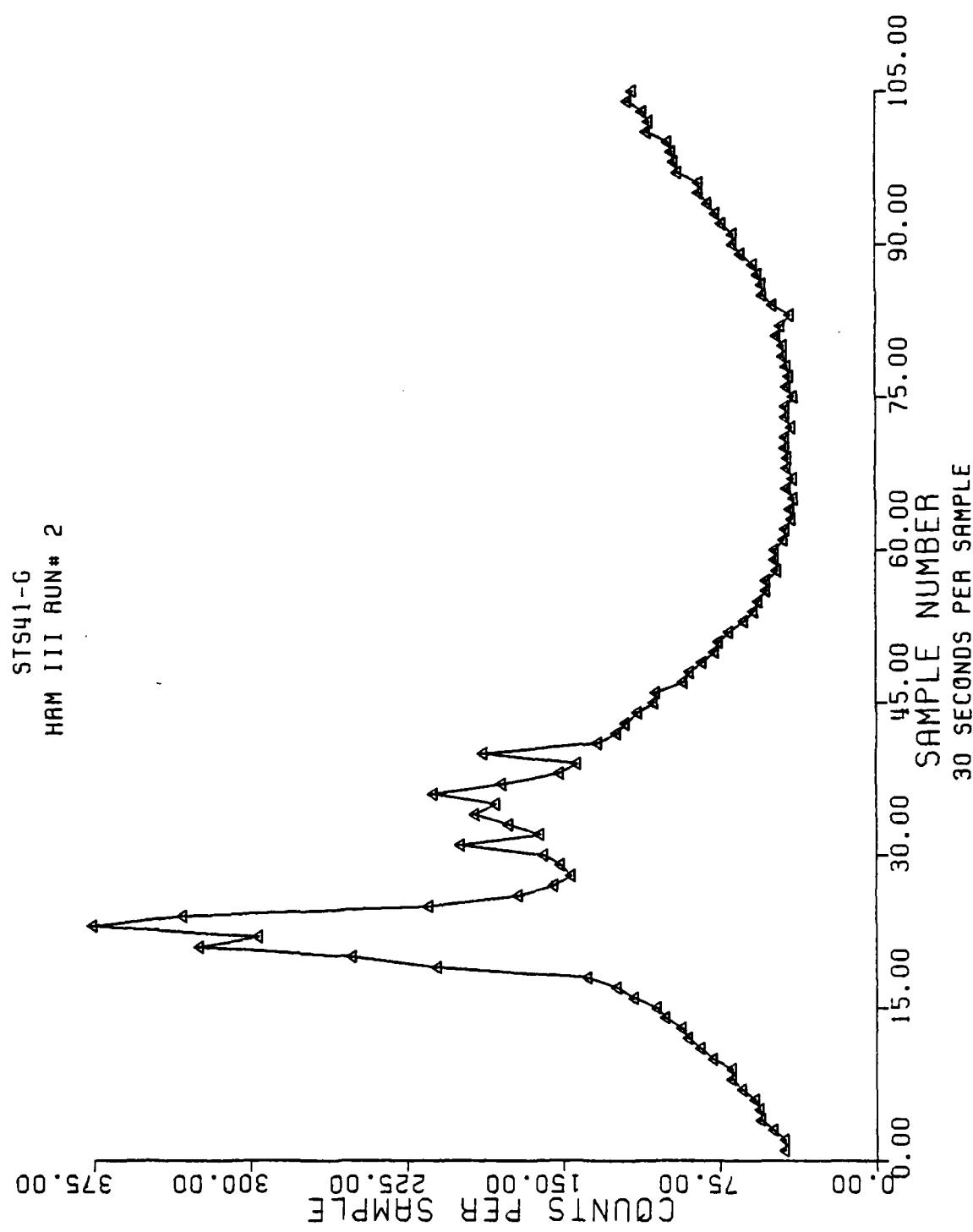


Figure 28

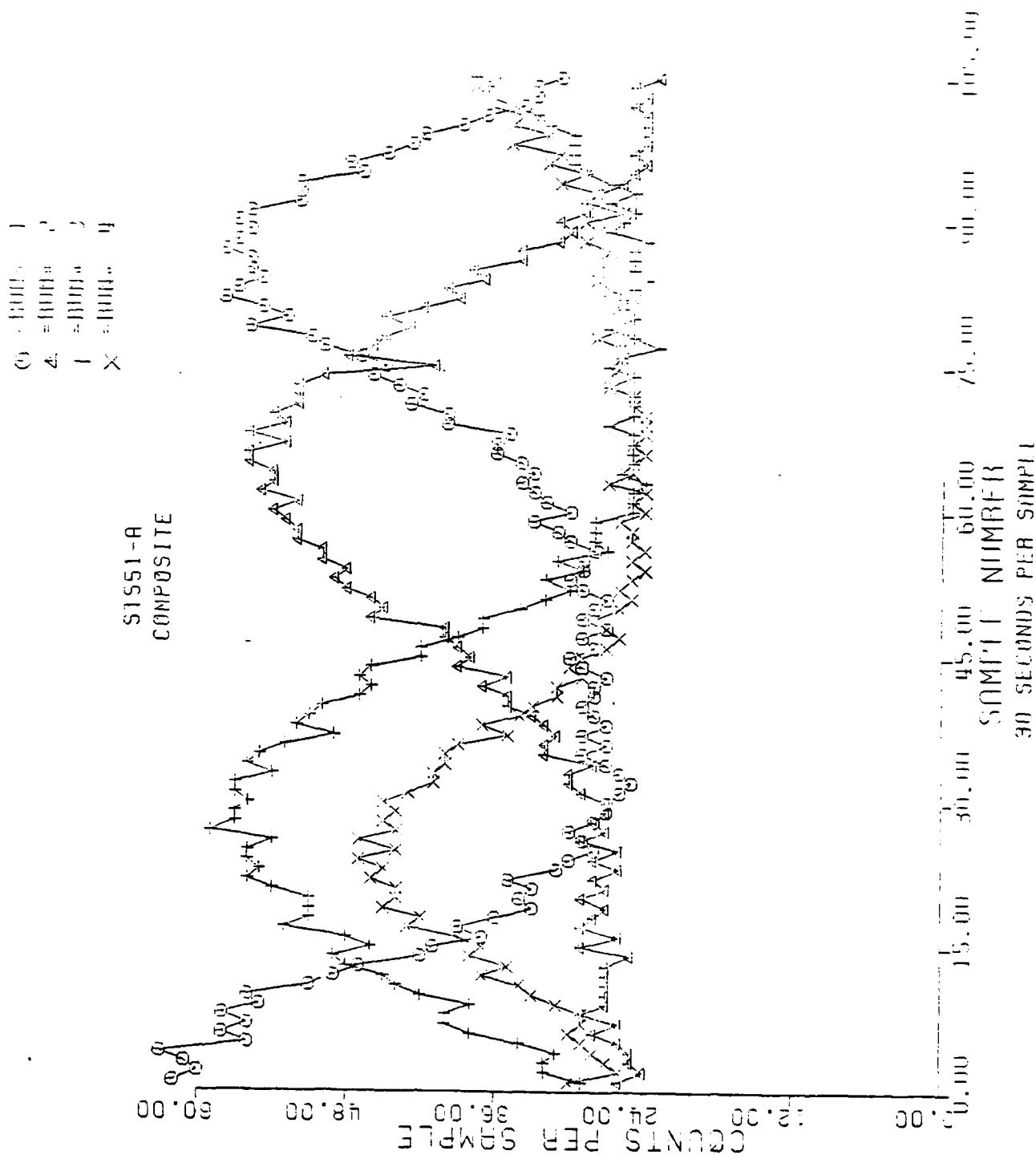


TABLE 1
PRM DATA FROM STS-41C

RAW DATA

MET	0/06:08:58	5/16:15:XX
Counts	5304	1658
Average Count Rate	372.21/hr	146.34/hr
Std Dev	<u>+19.29/hr</u>	<u>+12.10/hr</u>
rem	17.7 mrem	6.41 mrem
rad	1.46 mrad	.508 mrad
Hours	14.25 hrs	11.33 hrs

TABLE 2

PRM DATA FROM STS-41C

AVERAGE DOSE RATES

MET	0/06:08:58	5/16:15:XX
Dose Rate (mrem/hr)	1.2421	.5658
Dose Rate (mrad/hr)	.1025	.0448

Average dose rate for both operations:

(mrem/hr) .904

(mrad/hr) .074

Mission Duration: 6 days 23 hours 40 minutes.

Estimated Total Mission Dosage: 151.571 mrem

12.407 mrad

TABLE 3

PRM DATA FROM STS-41D

RAW DATA

MET	03/23:41:00	04/19:15:00	05/17:36:XX
Counts	2217	2110	2489
Average Count Rate	278.87/hr	225.67/hr	192.80/hr
Std Dev	16.70/hr	15.02/hr	13.89/hr
rem	2.26 mrem	2.35 mrem	2.80 mrem
rad	.234 mrad	.233 mrad	.276 mrad
Hours	7.95	9.35	12.91

TABLE 4
PRM DATA FROM STS-41D
AVERAGE DOSE RATES

MET	03/23:41:00	04/19:15:00	05/17:36:XX
Dose Rate (mrem/hr)	.284	.251	.217
Dose Rate (mrads/hr)	.029	.025	.021

Average dose rate for both operations:

(mrem/hr) .234

(mrads/hr) .023

Mission Duration: 6 days 56 minutes.

Estimated Total Mission Dosage: 33.914 mrem

3.333 mrads

TABLE 5

PRM DATA FROM STS-41G

RAW DATA

MET	1/09:48:00	6/10:01:00
Counts	3869	3166
Average Count Rate	219.21/hr	204.79/hr
Std Dev	14.81/hr	14.31/hr
rem	10.4 mrem	8.33 mrem
rad	.970 mrad	.790 mrad
Hours	17.65 hrs	15.46 hrs

TABLE 6
PRM DATA FROM STS-41G

AVERAGE DOSE RATES

MET	1/09:48:00	6/10:01:00
Dose Rate (mrem/hr)	.589	.539
Dose Rate (mrad/hr)	.055	.051

Average dose rate for both operations:

(mrem/hr) .564

(mrad/hr) .053

Mission Duration: 8 days 5 hours 23 minutes.

Estimated Total Mission Dosage: 111.324 mrem

10.461 mrad

TABLE 7
PRM DATA FROM STS-51A

RAW DATA

MET	07/23:16:00	27/08:04:43
Counts	2874	3367
Average Count Rate	203.40/hr	249.96/hr
Std Dev	14.26/hr	15.81/hr
rem	2.98 mrem	3.47 mrem
rad	.307 mrad	.368 mrad
Hours	14.13 hrs	13.47 hrs

TABLE 8
PRM DATA FROM STS-51A

AVERAGE DOSE RATES

MET	07/23:16:00	2/08:04:43
Dose Rate (mrem/hr)	.211	.258
Dose Rate (mrad/hr)	.0217	.0273

Average dose rate for both operations:

(mrem/hr) .2345

(mrad/hr) .0245

Mission Duration: 7 days 23 hours 45 minutes.

Estimated Total Mission Dosage: 44.9654 mrem

4.6979 mrad

dosage was greatest on STS-41C at 151.571 mrem (12.407 mrad) (see table 2).

The operation which yielded the highest dose rate was the STS-41C data take at a mission elapsed time (MET) of 0/06:08:58. The PRM data from this operation is surprisingly high and cannot be correlated to HRM-III (gamma-ray) data from approximately the same time frame.

SECTION IV

CONCLUSIONS

For the most part, RME data from the STS-41C, 41D, 41G, and 51A flights are consistent with data taken on previous missions. The higher gamma-ray count rates (HRM-III) from STS-41G are attributed to the higher orbital inclination of that flight. The unusually high neutron/proton data (PRM) from the first STS-41C operation remains unexplained. All other variations in the data correspond to natural external sources of radiation (e.g. the South Atlantic Anomaly, and the Southeast Asian Anomaly).

The RME equipment performed very well with only one anomaly experienced in 28 total operations. This failure of the PRM was due to a low battery, and after a battery change, two successful operations were accomplished.

Future flights of the RME will contribute to the data base of background radiation. Different mission profiles will yield data from different altitudes and orbital inclinations. Such a data base will prove useful for planning future space systems, including crew health and safety requirements, as may exist in permanently inhabited stations and platforms.

REFERENCES

1. STS-6 Report, (In publishing), AFTAC, Caplan, et al.
2. Results From Radiation Monitoring Equipment Experiment on STS-8, AFTAC-TR-84-4, 9 July 1984, Madonna, et al.
3. Results From Radiation Monitoring Equipment Experiment on STS-11, AFTAC-TR-85-2, 14 March 1985, Madonna, et al.
4. HRM-III Handheld Radiation Monitor User's Handbook, EG&G Report No. EG&G83-2424 S-347-MN.
5. Pocket Neutron REM Meter, W. Quam, T. DeDuca, et al., preprint.

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APPENDIX A
RAW DATA FROM STS-41C

$$\begin{aligned}
 X &= 0.36650 \\
 Y &= -23.29.1 \\
 Z &= -60.67.3
 \end{aligned}$$

STUDENT EXP/FRNCE/GAS

RHE STUDENT FILE

CHANNEL	CCNTS/SEC								
1	2	3	4	5	6	7	8	9	10
0-1	25	0-22	25	0-13	30	0-64	34	0-85	34
0-2	23	0-23	26	0-14	29	0-65	32	0-86	34
0-3	24	0-24	27	0-15	32	0-66	36	0-87	33
0-4	22	0-25	28	0-16	31	0-67	36	0-88	31
0-5	26	0-26	26	0-17	31	0-68	33	0-89	31
0-6	27	0-27	27	0-18	33	0-69	34	0-90	34
0-7	26	0-28	25	0-19	34	0-70	34	0-91	33
0-8	21	0-29	27	0-50	32	0-71	35	0-92	30
0-9	25	0-30	27	0-51	32	0-72	34	0-93	36
0-10	26	0-31	28	0-52	32	0-73	32	0-94	34
0-11	26	0-32	30	0-53	33	0-74	34	0-95	33
0-12	26	0-33	30	0-54	34	0-75	34	0-96	33
0-13	25	0-34	28	0-55	32	0-76	33	0-97	31
0-14	27	0-35	28	0-56	33	0-77	33	0-98	35
0-15	27	0-36	29	0-57	36	0-78	34	0-99	34
0-16	25	0-37	29	0-58	35	0-79	33	0-00	31
0-17	26	0-38	27	0-59	36	0-80	35	0-01	34
0-18	24	0-39	21	0-60	35	0-81	31	0-02	34
0-19	27	0-40	32	0-61	34	0-82	32	0-03	32
0-20	26	0-41	30	0-62	35	0-83	31	0-04	31
0-21	27	0-42	31	0-63	30	0-84	30	0-05	31

12-6

41-D/BAS

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12-5

41-C/FIN

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247/13:57:4018

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155.36

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W 9: NEW DATA PADS

12-8

41-C/Fin

71

047:1038:54.1 Grant
03/2147:04.1

$$\begin{array}{r}
 X = 14196055 \\
 Y = 16166505 \\
 C = 1612314 \\
 X = 8466 \\
 Y = -33961 \\
 Z = -108541
 \end{array}$$

A vertical line with three circular weights attached to its ends and middle, resembling a stylized letter 'A' or a balance scale.

DATE	TIME	CHANNEL	COUNTS SEC						
5/16/31	9:37:00	0_22	42	0_23	51	0_24	46	0_25	30
		0_23	40	0_24	58	0_25	45	0_26	28
		0_24	42	0_25	59	0_26	43	0_27	27
		0_25	43	0_26	56	0_27	42	0_28	27
		0_26	41	0_27	59	0_28	44	0_29	28
		0_27	43	0_28	57	0_29	42	0_30	29
		0_28	43	0_29	59	0_30	41	0_31	29
		0_29	45	0_30	60	0_31	39	0_32	29
		0_30	47	0_31	57	0_32	40	0_33	29
		0_31	45	0_32	59	0_33	38	0_34	29
		0_32	49	0_33	56	0_34	39	0_35	28
		0_33	49	0_34	54	0_35	35	0_36	29
		0_34	52	0_35	57	0_36	36	0_37	27
		0_35	53	0_36	55	0_37	34	0_38	27
		0_36	54	0_37	54	0_38	34	0_39	27
		0_37	55	0_38	53	0_39	33	0_40	28
		0_38	55	0_39	50	0_40	33	0_41	27
		0_39	55	0_40	51	0_41	30	0_42	27
		0_40	60	0_41	48	0_42	31	0_43	28
		0_41	51	0_42	48	0_43	30	0_44	28
		0_42	59	0_43	48	0_44	29	0_45	27

245/16 01:31 8m/s

2/03:19:41

$x = 8359.026$ $\dot{x} = -3243.7$

$y = 114239.05$ $\dot{y} = 9966.10$

$z = 10462538$ $\dot{z} = 4001.74$

246/08:21:25 Sun+

02/19:35:31

$x = -487.1413$ $\dot{x} = 4537.3$

$y = -18820787$ $\dot{y} = -6275.9$

$z = 103508918$ $\dot{z} = 1293.8$

SAT 2/19:38:

HRW DATA PADS

CHANNEL	COUNTS/SEC								
0_1	30	0_22	56	0_43	36	0_64	30	0_85	31
0_2	31	0_23	55	0_44	32	0_65	30	0_86	32
0_3	35	0_24	51	0_45	31	0_66	31	0_87	30
0_4	38	0_25	53	0_46	30	0_67	29	0_88	32
0_5	38	0_26	50	0_47	30	0_68	30	0_89	31
0_6	40	0_27	51	0_48	31	0_69	30	0_90	35
0_7	43	0_28	49	0_49	29	0_70	31	0_91	32
0_8	45	0_29	49	0_50	21	0_71	30	0_92	32
0_9	44	0_30	47	0_51	31	0_72	31	0_93	34
0_10	47	0_31	45	0_52	29	0_73	30	0_94	35
0_11	45	0_32	43	0_53	31	0_74	31	0_95	33
0_12	48	0_33	43	0_54	29	0_75	31	0_96	36
0_13	51	0_34	41	0_55	29	0_76	29	0_97	36
0_14	53	0_35	38	0_56	24	0_77	20	0_98	39
0_15	52	0_36	39	0_57	31	0_78	29	0_99	37
0_16	54	0_37	38	0_58	29	0_79	29	0_100	42
0_17	54	0_38	37	0_59	29	0_80	27	0_101	43
0_18	54	0_39	37	0_60	30	0_81	27	0_102	45
0_19	54	0_40	24	70	29	0_82	30	0_103	45
0_20	52	0_41	33	70	31	0_83	27	0_104	47
0_21	52	0_42	33	70	29	0_84	30	0_105	49

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41-0/FIN

01/01/58-491
01/01/14-101391

01/02/03:45

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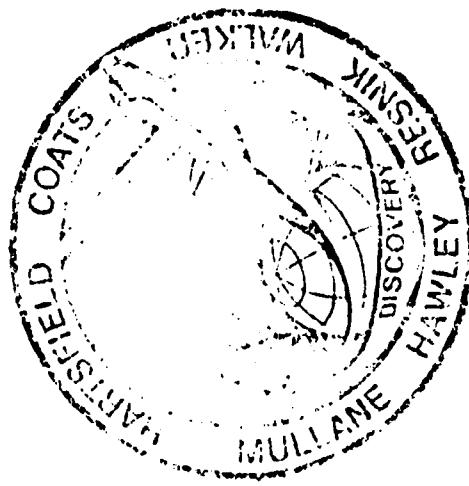
12-5

41-0/11N

place

STS
41-D

PAYLOAD
OPS C/L



APPENDIX B
RAW DATA FROM STS-41D

PRM

STUDENT
EXP

1 Activation & Checkout

Unstow PRM

If second operation, replace, mark and stow
used battery

Set Rotary sw - HRS
ON/OFF sw - ON

✓Display counts down from 9999 and record
MET on PRM DATA PAD when Display = 0.00

- * If display shows a colon or is *
- * blank, set ON/OFF sw - OFF; *
- * replace, mark, and stow used *
- * battery and repeat step 1 *

Report MET to MCC

Restow PRM (leave ON)

2 Data Recording

8-18 hrs after step 1, unstow PRM

Set rotary switch to appropriate positions
and record display outputs on PRM DATA PAD

Set ON/OFF sw - OFF

Stow PRM

PRM DATA PAD

0.00 MET	01_06:08:58	_/_:_:_:_
HRS	14.25	_/_:_:_:_
CNTS	5.304 E (+) 0.3	. _ _ E (_) _ _
RAD	1.46 E (-) 0.3	. _ _ E (_) _ _
REM	1.72 E (-) 0.2	. _ _ E (_) _ _

343



STS
41-C
PAYLOAD
OPS C/L

SMM
OPS

SMM
DATA
RETURN

RME
REF DATA

FSS
ACT

PRM

STUDENT EXP

1 Activation & Checkout

Unstow PRM

If second operation, replace, mark and stow used battery

Set Rotary sw - HRS

ON/OFF sw - ON

✓ Display counts down from 9999 and record MET on PRM DATA PAD when Display = 0.00

* If display shows a colon or is *

* blank, set ON/OFF sw - OFF; *

* replace, mark, and stow used *

* battery and repeat step 1 *

Report MET to MCC

Restow PRM (leave ON)

2 Data Recording

8-18 hrs after step 1, unstow PRM

Set rotary switch to appropriate positions and record display outputs on PRM DATA PAD

Set ON/OFF sw - OFF

Stow PRM

PRM DATA PAD

5/16:15 →

0.00 MET	<u>3104:50</u>	<u>5117:27</u>
HRS	<u>-11.05</u>	<u>11.33</u>
CNTS	<u>FAKE ()</u>	<u>1.658 E (±) 3</u>
RAD	<u>0.00 E ()</u>	<u>5.08 E (±) 4</u>
REM	<u>0.00 E ()</u>	<u>6.41 E (±) 3</u>

13.1.11 6/03:30

8-11

41-C/FIN 1

PRIME C360 C360 DATA C360 OPS C360 RETURN CFS CPS

INITIAL STATE		CHANNEL		CHARACTERISTICS		DATA PADS		HRM		TIME	
STATE	TRANSITION	STATE	TRANSITION	CHARACTER	STATE	CHARACTER	STATE	CHARACTER	STATE	CHARACTER	STATE
0	-1	41	-	0-22	27	0-43	30	0-64	47	0-83	40
0	-2	30	-	0-23	26	0-44	30	0-65	49	0-86	40
0	-3	28	-	0-24	26	0-45	28	0-66	47	0-87	37
0	-4	26	-	0-25	27	0-46	32	0-67	49	0-88	38
0	-5	24	-	0-26	24	0-47	31	0-68	51	0-89	36
0	-6	19	-	0-27	28	0-48	33	0-69	51	0-90	34
0	-7	27	-	0-28	29	0-49	33	0-70	51	0-91	34
0	-8	21	-	0-29	27	0-50	34	0-71	50	0-92	34
0	-9	27	-	0-30	27	0-51	36	0-72	51	0-93	33
0	-10	30	-	0-31	27	0-52	36	0-73	50	0-94	31
0	-11	26	-	0-32	26	0-53	32	0-74	48	0-95	30
0	-12	25	-	0-33	28	0-54	38	0-75	49	0-96	30
0	-13	23	-	0-34	28	0-55	46	0-76	51	0-97	30
0	-14	24	-	0-35	27	0-56	39	0-77	46	0-98	29
0	-15	25	-	0-36	24	0-57	40	0-78	46	0-99	29
0	-16	23	-	0-37	26	0-58	43	0-79	47	0-100	28
0	-17	25	-	0-38	24	0-59	45	0-80	45	0-101	27
0	-18	29	-	0-39	27	0-60	43	0-81	45	0-102	26
0	-19	28	-	0-40	24	0-61	43	0-82	43	0-103	26
0	-20	27	-	0-41	27	0-62	41	0-83	41	0-104	26
0	-21	28	-	0-42	31	0-63	47	0-84	40	0-105	25

8-8

4i-c/FIN

63

This

INIT 2,118:10

HRM DATA PADS READ AT 2/21:30

INIT	COUNTS/SEC	CHANNEL	COUNTS/SEC	CHANNEL	COUNTS/SEC	CHANNEL	COUNTS/SEC	CHANNEL
0-1	42	0-22	30	0-43	38	0-64	41	0-85
0-2	46	0-23	32	0-44	40	0-65	41	0-86
0-3	37	0-24	31	0-45	41	0-66	41	0-87
0-4	37	0-25	31	0-46	46	0-67	41	0-88
0-5	36	0-26	32	0-47	45	0-68	41	0-89
0-6	36	0-27	33	0-48	44	0-69	38	0-90
0-7	35	0-28	33	0-49	46	0-70	40	0-91
0-8	35	0-29	30	0-50	47	0-71	39	0-92
0-9	35	0-30	34	0-51	45	0-72	38	0-93
0-10	32	0-31	32	0-52	46	0-73	37	0-94
0-11	34	0-32	32	0-53	46	0-74	37	0-95
0-12	32	0-33	32	0-54	44	0-75	34	0-96
0-13	33	0-34	30	0-55	46	0-76	34	0-97
0-14	34	0-35	32	0-56	46	0-77	-	0-98
0-15	34	0-36	35	0-57	44	0-78	35	0-99
0-16	36	0-37	34	0-58	45	0-79	33	0-100
0-17	32	0-38	33	0-59	47	0-80	33	0-101
0-18	32	0-39	35	0-60	45	0-81	33	0-102
0-19	31	0-40	38	0-61	44	0-82	32	0-103
0-20	34	0-41	37	0-62	45	0-83	34	0-104
0-21	33	0-42	38	0-63	42	0-84	32	0-105

INIT MET 51,1905

READ 3/21:34

INIT	COUNTS/SEC	CHANNEL	COUNTS/SEC	CHANNEL	COUNTS/SEC	CHANNEL	COUNTS/SEC	CHANNEL
0-1	49	0-22	36	0-43	26	0-64	30	0-85
0-2	53	0-23	33	0-44	26	0-65	30	0-86
0-3	52	0-24	34	0-45	26	0-66	27	0-87
0-4	52	0-25	30	0-46	25	0-67	30	0-88
0-5	52	0-26	32	-	24	0-68	31	0-89
0-6	54	0-27	32	0-48	27	0-69	32	0-90
0-7	53	0-28	30	0-49	27	0-70	20	0-91
0-8	50	0-29	28	0-50	6	0-71	31	0-92
0-9	50	0-30	28	0-51	26	0-72	34	0-93
0-10	50	0-31	29	0-52	26	0-73	37	0-94
0-11	52	0-32	29	0-53	27	0-74	35	0-95
0-12	453	0-33	29	0-54	26	0-75	36	0-96
0-13	44	0-34	27	0-55	26	0-76	35	0-97
0-14	43	0-35	27	0-56	27	0-77	40	0-98
0-15	45	0-36	27	0-57	26	0-78	39	0-99
0-16	40	0-37	26	0-58	27	0-79	42	0-100
0-17	41	0-38	25	0-59	25	0-80	47	0-101
0-18	42	0-39	26	0-60	27	0-81	47	0-102
0-19	41	0-40	27	0-61	27	0-82	46	0-103
0-20	38	0-41	25	0-62	26	3	47	0-104
0-21	38	0-42	24	0-63	27	0-84	51	0-105

9-3

44/3-14

8-7

0,20,20

Read at 2/07:40

INIT	ME	DATA PADS	HRH	DATA PADS	HRH	CHANNEL	COUNTS/SEC	CHANNEL	COUNTS/SEC	CHANNEL	COUNTS/SEC
0 - -	3 5	0 - 22	5 11	0 - 43	3 3	0 - 64	2 3	0 - 85	3 3	0 - 85	3 3
0 - -	3 4	0 - 23	5 9	0 - 44	3 2	0 - 65	2 3	0 - 86	3 4	0 - 86	3 4
0 - -	3 5	0 - 24	5 3	0 - 45	3 2	0 - 66	2 3	0 - 87	2 5	0 - 87	2 5
0 - -	3 5	0 - 25	5 0	0 - 46	3 2	0 - 67	2 5	0 - 88	2 5	0 - 88	2 5
0 - -	3 6	0 - 26	5 4	0 - 47	3 0	0 - 68	2 3	0 - 89	2 6	0 - 89	2 6
0 - -	3 6	0 - 27	5 2	0 - 48	2 9	0 - 69	2 4	0 - 90	2 8	0 - 90	2 8
0 - -	4 0	0 - 28	4 8	0 - 49	2 8	0 - 70	2 5	0 - 91	2 8	0 - 91	2 8
0 - -	4 1	0 - 29	4 9	0 - 50	2 7	0 - 71	2 9	0 - 92	2 8	0 - 92	2 8
0 - -	4 1	0 - 30	4 7	0 - 51	2 7	0 - 72	2 7	0 - 93	3 0	0 - 93	3 0
0 - -	4 0	0 - 31	4 3	0 - 52	2 5	0 - 73	2 3	0 - 94	2 0	0 - 94	2 0
0 - 1	4 3	0 - 32	4 6	0 - 53	2 9	0 - 74	2 3	0 - 95	3 1	0 - 95	3 1
0 - 1	4 5	0 - 33	4 7	0 - 54	2 6	0 - 75	2 3	0 - 96	3 2	0 - 96	3 2
0 - 1	4 5	0 - 34	4 5	0 - 55	2 4	0 - 76	2 4	0 - 97	3 0	0 - 97	3 0
0 - 1	4 6	0 - 35	4 9	0 - 56	2 5	0 - 77	2 3	0 - 98	3 5	0 - 98	3 5
0 - 1	4 5	0 - 36	5 2	0 - 57	2 6	0 - 78	3 4	0 - 99	3 5	0 - 99	3 5
0 - 1	4 7	0 - 37	4 0	0 - 58	2 4	0 - 79	2 4	0 - 0 0	3 6	0 - 0 0	3 6
0 - 1	4 8	0 - 38	4 7	0 - 59	2 3	0 - 80	2 4	0 - 0 1	3 7	0 - 0 1	3 7
0 - 1	4 7	0 - 39	3 5	0 - 60	2 3	0 - 81	2 5	0 - 0 2	3 9	0 - 0 2	3 9
0 - 1	4 9	0 - 40	3 3	0 - 61	2 4	0 - 82	2 2	0 - 0 3	4 1	0 - 0 3	4 1
0 - 2	5 7	0 - 41	3 6	0 - 62	2 4	0 - 83	2 2	0 - 0 4	4 2	0 - 0 4	4 2
0 - 2	5 7	0 - 42	3 2	0 - 63	2 5	0 - 84	2 5	0 - 0 5	4 1	0 - 0 5	4 1

8-5

41-C/FIN

STUDENT
EXP

(MSI)



STS
41-C
PAYLOAD
OPS C/L

FSS
ACT

OPS

SMM
RETURN

SMM
DATA

GAS

OPS

C360

C360
REF DATA

RHE

PRM

1 Activation & Checkout

Unstow PRM

If second operation, replace, mark and stow used battery

Set Rotary sw - HRS
ON/OFF sw - ON

✓Display counts down from 9999 and record
MET on PRM DATA PAD when Display = 0.00

- * If displays shows a colon is *
- * blank, set ON/OFF sw - OFF; *
- * replace, mark, and stow used *
- * battery and repeat step 1 *

Report MET to MCC
Restow PRM (leave ON)

GAS

2 Data Recording

8-18 hrs after step 1, unstow PRM

Set Rotary sw to appropriate positions
and record display outputs on PRM DATA PAD

Set ON/OFF sw - OFF
Stow PRM

PRM DATA PAD

0.00 MET	03/23:41:00	04/19:15:00
HRS	7.95	9.35
CNIS	2.217 E (+) 03	2.110 E (+) 03
RAD	2.34 E (-) 04	2.33 E (-) 04
REM	2.26 E (-) 03	2.35 E (-) 03

OFF 05/04:37 41-12
12-11 41-D/FIN

STUDENT EXP/RME/GAS

STUDENT
EXP

RME

05/04/42
05/04/42 activated PRM
05/17/36 deactivated PAM

12.91 HRS
 2.489×10^3 CNTS
 2.76×10^{-4} RAD
 2.80×10^{-3} REM

extra run

This Page Intentionally Blank

12-12

12-10

41-D/FIN

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX C
RAW DATA FROM STS-41G

PL OPS

orange

INIT	NET	1 / 0 6 : 4 4 : 2 6	CHAN	COUNTS/SEC																
0	-1	148	0	22	153	0	43	50	0	64	57	0	85	214						
0	-2	109	0	23	190	0	44	49	0	65	61	0	86	198						
0	-3	161	0	24	249	0	45	43	0	66	66	0	87	181						
0	-4	293	0	25	269	0	46	42	0	67	76	0	88	153						
0	-5	454	0	26	194	0	47	42	0	68	88	0	89	129						
0	-6	516	0	27	132	0	48	40	0	69	107	0	90	117						
0	-7	462	0	28	121	0	49	41	0	70	127	0	91	123						
0	-8	284	0	29	112	0	50	39	0	71	146	0	92	159						
0	-9	196	0	30	112	0	51	38	0	72	164	0	93	314						
0	-10	168	0	31	105	0	52	39	0	73	186	0	94	791						
0	-11	155	0	32	102	0	53	40	0	74	198	0	95	1640						
0	-12	141	0	33	95	0	54	40	0	75	210	0	96	2459						
0	-13	139	0	34	92	0	55	40	0	76	231	0	97	2667						
0	-14	135	0	35	85	0	56	37	0	77	240	0	98	2351						
0	-15	134	0	36	74	0	57	44	0	78	248	0	99	2518						
0	-16	134	0	37	72	0	58	47	0	79	258	0	0	1203						
0	-17	134	0	38	71	0	59	50	0	80	222	0	01	399						
0	-18	151	0	39	62	0	60	59	0	81	217	0	02	250						
0	-19	138	0	40	60	0	61	52	0	82	215	0	03	17						
0	-20	139	0	41	55	0	62	56	0	83	217	0	04	136						
0	-21	144	0	42	52	0	63	53	0	84	217	0	05	134						

12-5

PL OPS/41-G/ FIN

INIT NET 5105:50:

NRW DATA PADS					
CHANNEL	COUNTS/SEC	CHANNEL	COUNTS/SEC	CHANNEL	COUNTS/SEC
0 - 1	180	0 - 2 2	133	0 - 4 3	43
0 - 2	246	0 - 2 3	122	0 - 4 4	43
0 - 3	252	0 - 2 4	115	0 - 4 5	34
0 - 4	342	0 - 2 5	107	0 - 4 6	44
0 - 5	572	0 - 2 6	105	0 - 4 7	42
0 - 6	512	0 - 2 7	105	0 - 4 8	44
0 - 7	500	0 - 2 8	99	0 - 4 9	40
0 - 8	381	0 - 2 9	44	0 - 5 0	44
0 - 9	339	0 - 3 0	90	0 - 5 1	43
0 - 10	341	0 - 3 1	81	0 - 5 2	45
0 - 11	403	0 - 3 2	78	0 - 5 3	46
0 - 12	409	0 - 3 3	76	0 - 5 4	47
0 - 13	650	0 - 3 4	73	0 - 5 5	47
0 - 14	510	0 - 3 5	66	0 - 5 6	46
0 - 15	634	0 - 3 6	60	0 - 5 7	49
0 - 16	564	0 - 3 7	58	0 - 5 8	47
0 - 17	484	0 - 3 8	56	0 - 5 9	48
0 - 18	324	0 - 3 9	53	0 - 6 0	50
0 - 19	2227	0 - 4 0	52	0 - 6 1	49
0 - 20	761	0 - 4 1	46	0 - 6 2	53
0 - 21	118	0 - 4 2	47	0 - 6 3	57

12-7

PL OPS/41-G/FIN

RME/TLD/GAS

INIT 1, 02:50:00

		HRM DATA PADS			
CHANNEL	COUNTS/SEC	CHANNEL	COUNTS/SEC	CHANNEL	COUNTS/SEC
0--1	81	0-22	186	0-43	123
0--2	82	0-23	157	0-44	111
0--3	89	0-24	151	0-45	123
0--4	88	0-25	188	0-46	116
0--5	92	0-26	127	0-47	112
0--6	94	0-27	127	0-48	108
0--7	100	0-28	118	0-49	105
0--8	102	0-29	123	0-50	96
0--9	103	0-30	127	0-51	91
0-10	106	0-31	120	0-52	87
0-11	111	0-32	121	0-53	80
0-12	109	0-33	123	0-54	77
0-13	116	0-34	122	0-55	70
0-14	115	0-35	137	0-56	69
0-15	124	0-36	139	0-57	69
0-16	133	0-37	148	0-58	54
0-17	140	0-38	152	0-59	57
0-18	159	0-39	153	0-60	47
0-19	173	0-40	159	0-61	44
0-20	205	0-41	129	0-62	41
0-21	207	0-42	123	0-63	42

12-8

PL OPS/41-G/ FIN

12-6

PRM

1 Activation & Checkout

Unstow PRM

If second operation, replace, mark and stow used battery

Set Rotary sw - HRS

ON/OFF sw - ON

✓ Display counts down from 9999 and record MET on PRM DATA PAD when Display = 0.00

- 1/9/41
- * If display shows a colon is *
 - * blank, set ON/OFF sw - OFF; *
 - * replace, mark, and stow used *
 - * battery and repeat step 1 *

Report MET to MCC

Restow PRM (leave ON)

2 Data Recording

8-18 hrs after step 1, unstow PRM

Set rotary switch to appropriate positions and record display outputs on PRM DATA PAD

Set ON/OFF sw - OFF

Stow PRM

PRM DATA PAD

0.00 MET	1109:48:00	6110:01:00
HRS	17.65	15.46
CNTS	3.869 E (±) 03	3.166 E (±) 03
RAD	9.70 E (±) 04	7.90 E (±) 04
REM	1.04 E (±) 02	8.33 E (±) 05

12-11

PL OPS/41-G/FIN

15-3

PL OPS/41-G/FIN

APPENDIX D
RAW DATA FROM STS-51A



Yellow

PAYLOAD OPS C/L

**STS
51-A**

MISSION

ONE

NET 0, 23, 27, 30		NEW DATA PADS									
CHANNEL	COUNTS/SEC	CHANNEL	COUNTS/SEC	CHANNEL	COUNTS/SEC	CHANNEL	COUNTS/SEC	CHANNEL	COUNTS/SEC	CHANNEL	COUNTS/SEC
0-1	626	0-2	355	0-3	27	0-4	33	0-5	56	0-6	56
0-2	609	0-3	31	0-4	29	0-5	34	0-6	58	0-7	57
0-3	61	0-4	30	0-5	30	0-6	36	0-7	56	0-8	57
0-4	63	0-5	28	0-6	28	0-7	36	0-8	56	0-9	57
0-5	56	0-6	29	0-7	29	0-8	35	0-9	56	0-0	57
0-6	58	0-7	30	0-8	27	0-9	40	0-0	56	0-1	56
0-7	56	0-8	28	0-9	29	0-0	40	0-1	52	0-2	52
0-8	58	0-9	27	0-0	28	0-1	43	0-2	52	0-3	52
0-9	55	0-0	27	0-1	27	0-2	42	0-3	52	0-4	52
0-10	56	0-1	26	0-2	29	0-3	44	0-4	52	0-5	47
0-11	57	0-2	25	0-3	30	0-4	46	0-5	52	0-6	48
0-12	49	0-3	26	0-4	29	0-5	45	0-6	45	0-7	45
0-13	47	0-4	27	0-5	29	0-6	47	0-7	43	0-8	42
0-14	42	0-5	27	0-6	28	0-7	52	0-8	39	0-9	39
0-15	41	0-6	26	0-7	30	0-8	51	0-9	37	0-0	37
0-16	37	0-7	27	0-8	31	0-9	53	0-0	34	0-1	34
0-17	39	0-8	27	0-9	33	0-0	55	0-1	33	0-2	33
0-18	36	0-9	28	0-0	30	0-1	58	0-2	34	0-3	34
0-19	33	0-0	29	0-1	32	0-2	57	0-3	33	0-4	33
0-20	34	0-1	28	0-2	33	0-3	55	0-4	31	0-5	31
0-21	33	0-2	28	0-3	34	0-4	55	0-5	31	0-6	31

卷五

10

INIT	NET	21	39	30	MAN DATA PADS
CHANNEL	OUTPUT	OUTPUT	OUTPUT	OUTPUT	CHANNEL
0	1	26	24	24	24
0	2	22	22	22	22
0	3	25	24	25	25
0	4	25	25	25	25
0	5	26	26	26	26
0	6	27	27	27	27
0	7	26	26	26	26
0	8	29	29	29	29
0	9	27	27	27	27
0	10	27	27	27	27
0	11	26	26	26	26
0	12	27	27	27	27
0	13	27	27	27	27
0	14	29	29	29	29
0	15	26	26	26	26
0	16	26	26	26	26
0	17	29	29	29	29
0	18	26	26	26	26
0	19	26	26	26	26
0	20	29	29	29	29
0	21	27	27	27	27
0	22	28	28	28	28
0	23	28	28	28	28
0	24	28	28	28	28
0	25	25	25	25	25
0	26	25	25	25	25
0	27	26	26	26	26
0	28	26	26	26	26
0	29	27	27	27	27
0	30	28	28	28	28
0	31	27	27	27	27
0	32	26	26	26	26
0	33	25	25	25	25
0	34	26	26	26	26
0	35	25	25	25	25
0	36	26	26	26	26
0	37	27	27	27	27
0	38	28	28	28	28
0	39	28	28	28	28
0	40	29	29	29	29
0	41	27	27	27	27
0	42	26	26	26	26
0	43	25	25	25	25
0	44	26	26	26	26
0	45	27	27	27	27
0	46	28	28	28	28
0	47	29	29	29	29
0	48	27	27	27	27
0	49	26	26	26	26
0	50	25	25	25	25
0	51	26	26	26	26
0	52	27	27	27	27
0	53	28	28	28	28
0	54	29	29	29	29
0	55	28	28	28	28
0	56	27	27	27	27
0	57	26	26	26	26
0	58	25	25	25	25
0	59	26	26	26	26
0	60	27	27	27	27
0	61	28	28	28	28
0	62	29	29	29	29
0	63	28	28	28	28
0	64	27	27	27	27
0	65	26	26	26	26
0	66	25	25	25	25
0	67	26	26	26	26
0	68	27	27	27	27
0	69	28	28	28	28
0	70	29	29	29	29
0	71	28	28	28	28
0	72	27	27	27	27
0	73	26	26	26	26
0	74	25	25	25	25
0	75	26	26	26	26
0	76	27	27	27	27
0	77	28	28	28	28
0	78	29	29	29	29
0	79	28	28	28	28
0	80	27	27	27	27
0	81	26	26	26	26
0	82	25	25	25	25
0	83	26	26	26	26
0	84	27	27	27	27
0	85	28	28	28	28
0	86	29	29	29	29
0	87	28	28	28	28
0	88	27	27	27	27
0	89	26	26	26	26
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0	98	25	25	25	25
0	99	26	26	26	26
0	100	27	27	27	27
0	101	28	28	28	28
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0	103	28	28	28	28
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0	105	26	26	26	26
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0	107	26	26	26	26
0	108	27	27	27	27
0	109	28	28	28	28
0	110	29	29	29	29
0	111	28	28	28	28
0	112	27	27	27	27
0	113	26	26	26	26
0	114	25	25	25	25
0	115	26	26	26	26
0	116	27	27	27	27
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0	118	29	29	29	29
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0	128	27	27	27	27
0	129	26	26	26	26
0	130	25	25	25	25
0	131	26	26	26	26
0	132	27	27	27	27
0	133	28	28	28	28
0	134	29	29	29	29
0	135	28	28	28	28
0	136	27	27	27	27
0	137	26	26	26	26
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0	148	27	27	27	27
0	149	28	28	28	28
0	150	29	29	29	29
0	151	28	28	28	28
0	152	27	27	27	27
0	153	26	26	26	26
0	154	25	25	25	25
0	155	26	26	26	26
0	156	27	27	27	27
0	157	28	28	28	28
0	158	29	29	29	29
0	159	28	28	28	28
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0	161	26	26	26	26
0	162	25	25	25	25
0	163	26	26	26	26
0	164	27	27	27	27
0	165	28	28	28	28
0	166	29	29	29	29
0	167	28	28	28	28
0	168	27	27	27	27
0	169	26	26	26	26
0	170	25	25	25	25
0	171	26	26	26	26
0	172	27	27	27	27
0	173	28	28	28	28
0	174	29	29	29	29
0	175	28	28	28	28
0	176	27	27	27	27
0	177	26	26	26	26
0	178	25	25	25	25
0	179	26	26	26	26
0	180	27	27	27	27
0	181	28	28	28	28
0	182	29	29	29	29
0	183	28	28	28	28
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0	185	26	26	26	26
0	186	25	25	25	25
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0	195	26	26	26	26
0	196	27	27	27	27
0	197	28	28	28	28
0	198	29	29	29	29
0	199	28	28	28	28
0	200	27	27	27	27
0	201	26	26	26	26
0	202	25	25	25	25
0	203	26	26	26	26
0	204	27	27	27	27
0	205	28	28	28	28
0	206	29	29	29	29
0	207	28	28	28	28
0	208	27	27	27	27
0	209	26	26	26	26
0	210	25	25	25	25
0	211	26	26	26	26
0	212	27	27	27	27
0	213	28	28	28	28
0	214	29	29	29	29
0	215	28	28	28	28
0	216	27	27	27	27
0	217	26	26	26	26
0	218	25	25	25	25
0	219	26	26	26	26
0	220	27	27	27	27
0	221	28	28	28	28
0	222	29	29	29	29
0	223	28	28	28	28
0	224	27	27	27	27
0	225	26	26	26	26
0	226	25	25	25	25
0	227	26	26	26	26
0	228	27	27	27	27
0	229	28	28	28	28
0	230	29	29	29	29
0	231	28	28	28	28
0	232	27	27	27	27
0	233	26	26	26	26
0	234	25	25	25	25
0	235	26	26	26	26
0	236	27	27	27	27
0	237	28	28	28	28
0	238	29	29	29	29
0	239	28	28	28	28
0	240	27	27	27	27
0	241	26	26	26	26
0	242	25	25	25	25
0	243	26	26	26	26
0	244	27	27	27	27
0	245	28	28	28	28
0	246	29	29	29	29
0	247	28	28	28	28
0	248	27	27	27	27
0	249	26	26	26	26
0	250	25	25	25	25
0	251	26	26	26	26
0	252	27	27	27	27
0	253	28	28	28	28
0	254	29	29	29	29
0	255	28	28	28	28
0	256	27	27	27	27
0	257	26	26	26	26
0	258	25	25	25	25
0	259	26	26	26	26
0	260	27	27	27	27
0	261	28	28	28	28
0	262	29	29	29	29
0	263	28	28	28	28

11, 19:35:00

WAN DATA PADS

CHANNEL	COUNTS/SEC								
0 - 1	29	0 - 22	56	0 - 43	47	0 - 64	26	0 - 86	25
0 - 2	32	0 - 23	55	0 - 44	46	0 - 65	25	0 - 86	25
0 - 3	32	0 - 24	56	0 - 45	42	0 - 66	25	0 - 87	25
0 - 4	31	0 - 25	56	0 - 46	42	0 - 67	25	0 - 88	24
0 - 5	34	0 - 26	59	0 - 47	39	0 - 68	25	0 - 89	27
0 - 6	38	0 - 27	57	0 - 48	37	0 - 69	27	0 - 90	26
0 - 7	40	0 - 28	57	0 - 49	37	0 - 70	25	0 - 91	25
0 - 8	40	0 - 29	57	0 - 50	34	0 - 71	25	0 - 92	27
0 - 9	38	0 - 30	56	0 - 51	32	0 - 72	25	0 - 93	25
0 - 10	42	0 - 31	57	0 - 52	32	0 - 73	27	0 - 94	27
0 - 11	44	0 - 32	57	0 - 53	32	0 - 74	25	0 - 95	29
0 - 12	45	0 - 33	57	0 - 54	29	0 - 75	27	0 - 96	30
0 - 13	48	0 - 34	59	0 - 55	31	0 - 76	26	0 - 97	30
0 - 14	49	0 - 35	55	0 - 56	27	0 - 77	23	0 - 98	30
0 - 15	46	0 - 36	53	0 - 57	28	0 - 78	25	0 - 99	30
0 - 16	48	0 - 37	49	0 - 58	28	0 - 79	27	0 - 100	32
0 - 17	53	0 - 38	52	0 - 59	28	0 - 80	25	0 - 101	33
0 - 18	51	0 - 39	51	0 - 60	25	0 - 81	26	0 - 102	35
0 - 19	51	0 - 40	50	0 - 61	25	0 - 82	26	0 - 103	37
0 - 20	51	0 - 41	47	0 - 62	25	0 - 83	24	0 - 104	37
0 - 21	54	0 - 42	46	0 - 63	24	0 - 84	24	0 - 105	38

AD-R154 676

RESULTS FROM RADIATION MONITORING EQUIPMENT EXPERIMENTS 2/2
ON STS-41C 41D \$!.. (U) AIR FORCE TECHNICAL APPLICATIONS
CENTER PATRICK AFB FL S E CASH ET AL. 18 APR 85

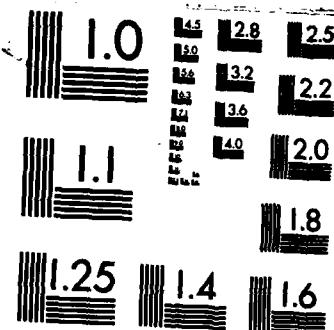
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AFTAC-TR-85-4

F/G 18/4

NL





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

INIT 11161 18:03:00

WAN DATA PADS

CHANNEL	COUNTS/SEC	CHANNEL	COUNTS/SEC	CHANNEL	COUNTS/SEC	CHANNEL	COUNTS/SEC	
0 - 1	30	0 - 22	36	0 - 13	16	0 - 13	25	0 - 13
0 - 2	26	0 - 23	45	0 - 14	30	0 - 15	25	0 - 16
0 - 3	27	0 - 24	47	0 - 15	31	0 - 16	24	0 - 17
0 - 4	28	0 - 25	44	0 - 16	27	0 - 17	26	0 - 18
0 - 5	29	0 - 26	47	0 - 17	26	0 - 18	24	0 - 19
0 - 6	30	0 - 27	49	0 - 18	27	0 - 19	24	0 - 20
0 - 7	29	0 - 28	50	0 - 19	27	0 - 20	25	0 - 21
0 - 8	30	0 - 29	50	0 - 20	26	0 - 21	25	0 - 22
0 - 9	31	0 - 30	45	0 - 21	25	0 - 22	24	0 - 23
0 - 10	32	0 - 31	43	0 - 22	26	0 - 23	23	0 - 24
0 - 11	33	0 - 32	45	0 - 23	25	0 - 24	22	0 - 25
0 - 12	34	0 - 33	41	0 - 24	25	0 - 25	21	0 - 26
0 - 13	31	0 - 34	45	0 - 25	24	0 - 26	20	0 - 27
0 - 14	32	0 - 35	40	0 - 26	23	0 - 27	19	0 - 28
0 - 15	33	0 - 36	39	0 - 27	25	0 - 28	18	0 - 29
0 - 16	34	0 - 37	30	0 - 28	24	0 - 29	17	0 - 30
0 - 17	31	0 - 38	35	0 - 29	23	0 - 30	16	0 - 31
0 - 18	32	0 - 39	37	0 - 30	22	0 - 31	15	0 - 32
0 - 19	33	0 - 40	43	0 - 31	21	0 - 32	14	0 - 33
0 - 20	34	0 - 41	43	0 - 32	20	0 - 33	13	0 - 34
0 - 21	35	0 - 42	43	0 - 33	19	0 - 34	12	0 - 35

2-8

PL OPS/51-A/BAS

2-6

PL OPS/51-A/BAS

PRM

1 Activation & Checkout

Unstow PRM

If second operation, replace, mark and stow used battery

Set Rotary sw - HRS

ON/OFF sw - ON

✓ Display counts down from 9999 and record MET on PRM DATA PAD when Display = 0.00

- * If display shows a colon is *
- * blank, set ON/OFF sw - OFF; *
- * replace, mark, and stow used *
- * battery and repeat step 1 *

Report MET to MCC

Restow PRM (leave ON)

2 Data Recording

8-18 hrs after step 1, unstow PRM

Set rotary switch to appropriate positions and record display outputs on PRM DATA PAD

Set ON/OFF sw - OFF

Stow PRM

PRM DATA PAD

0.00 MET 0, -3: 16:00		208:04:43
HRS	14.13	13.42
CNTS	2.874 E (±) 3	3.367 E (±) 3
RAD	-3.07 E (±) 4	-3.68 E (±) 4
REM	-2.98 E (±) 3	-3.47 E (±) 3

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